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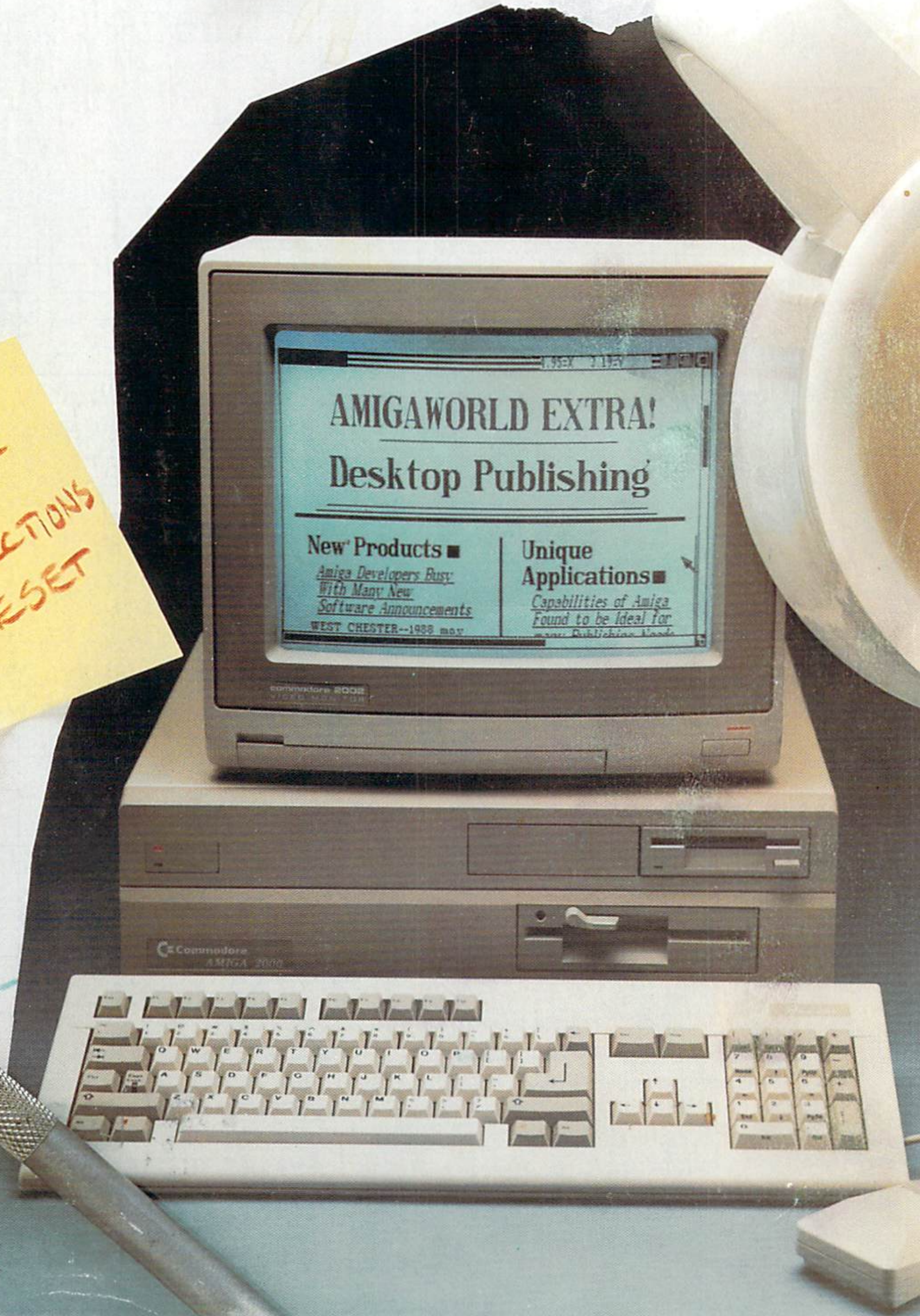
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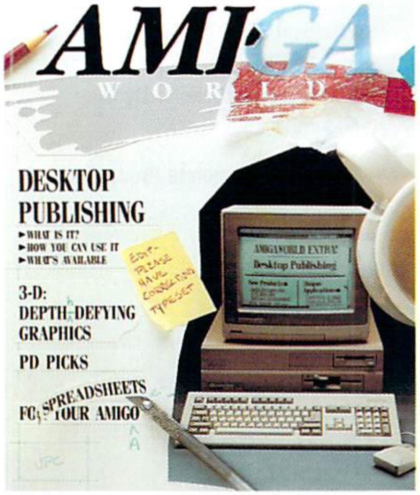
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COVER PHOTOGRAPH BY PAUL AVIS

With one industry source estimating that 300,000 programs will have been sold in 1987, desktop publishing is clearly a hot topic in computing. There's a lot you can do with such programs—and a lot you can't. **AmigaWorld** *examines the desktop publishing phenomenon and zeros in on the Amiga market. What's available? Should you buy now or hold out for a new generation of programs waiting in the wings?*

January 1988

CONTENTS

VOLUME 4, NUMBER 1

AmigaWorld (ISSN 0883-2390) is an independent journal not connected with Commodore Business Machines, Inc. *AmigaWorld* is published monthly by CW Communications/Peterborough, Inc., 80 Elm St., Peterborough, NH 03458. U.S. subscription rate is $19.97, one year. Canada $30.97 (Canadian funds), one year only. Mexico $17.97 (U.S. funds drawn on U.S. bank), one year only. Foreign $34.97 (U.S. funds drawn on U.S. bank), one year only. foreign Airmail, please inquire. Second class postage paid at Peterborough, NH, and at additional mailing offices. Phone: 603-924-9471. **Postmaster**: Send address changes to *AmigaWorld*, Subscription Services, PO Box 868, Farmingdale, NY 11735. Nationally distributed by International Circulation Distributors. *AmigaWorld* makes every effort to assure the accuracy of articles, listings and circuits published in the magazine. *AmigaWorld* assumes no responsibility for damages due to errors or omissions.

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Zeitgeist

Which Amiga should you *buy?*

By Guy Wright

THE BEGINNING OF a new year. (Even though this is really October and you are probably reading this in December.) Just returned from the AmiExpo in New York. . .it was a great show. A number of people asked what I thought about Commodore's new marketing plans and about the future of the A500, A1000 and A2000.

Commodore's marketing plans: Television ads were just beginning to appear and I thought that they looked pretty good (compared to the original Amiga 1000 ads two years ago). If Commodore concentrates on just getting their name out there, then I will be happy. If, on the other hand, they decide to market the Amiga as something in particular, then I will begin to worry, because it is a sure bet that they will pick the wrong something. Some genius will decide that the new Amiga 500 is the ultimate machine for developing weaving patterns, and Commodore will start running fourteen-page ad inserts in Weaver's World magazine. Whatever Commodore decides to do, I am encouraged, because something is better than nothing, even if that something is somewhat off the mark.

What is the future for the A500, A1000, A2000? This question came in many forms. Usually it was something like, "I don't own an Amiga yet. Which one should I buy?", or "I have been thinking about trading in my 1000 for a 2000. . ." The answer to all of these questions is "It depends on what you want to do with it and when." Right now, most of the hardware out there works on the A1000 and there are a bunch of companies still working on newer, bigger, better hardware for the A1000. The A500 has its share of hardware developers working on expansion, racks, multi-processor boards and whatnots, but there aren't a lot of things actually for sale today. When people buy thousands and thousands of A500s (and I think that they will), then more and more peripheral manufacturers will push A500 products out there.

The A2000 has even fewer peripherals available now than the A500, but it will be the machine of choice for manufacturers who are developing heavy duty vertical market type devices like broadcast-quality video hardware and software.

The A1000 has a gray future. Commodore's official line on every computer that they ever made is "As long as people are buying them, we will continue to support them." I don't believe that Commodore is manufacturing any new A1000s, but I could be wrong. Currently there is more going on with the 1000 than the 500 and 2000 put together. There are more peripherals out there now and there seem to be a lot of new peripherals coming out in the near future. If you need to do something tomorrow, then stick with the A1000. (You should even be able to get a good deal on a used 1000, if you can find one.) If you just want a more powerful machine and don't have anything special in mind, then stick with the A1000. The A1000 should be around for quite a while yet and in some ways is more versatile than either the A500 or the A2000. All the new software being developed should run on the 1000 (until souped-up bridge-card utilities start being developed), and there are a lot of A1000 supporters out there. If you are looking into buying a first computer and don't have anything special in mind right away, then the A500 (with the bundled software packages) is a great buy and there are enough peripherals and expansion units out there now to keep you busy for quite a while. All the software works and the 500 has the brightest future of the three machines. If you are looking into areas that will require specialized peripherals in the future (broadcast-quality video, multi-megabyte hard-disk drives, MS DOS, etc.), then the A2000 is your best bet. The 2000 has a reasonable future, but don't expect it to dominate the market and don't expect bargain prices for those specialized peripherals. There is also some question about the compatibility of the A2000 with some software, particularly action games that use the keyboard (there are keyboard timing differences between the 2000 and the 500 and 1000).

Conclusions? Don't scrap your A1000 just because you are worried about owning a doomed machine. If you aren't in a giant hurry to buy fancy peripherals and just want a very good computer, then look into the A500. If you want an Amiga but the boss won't pay for anything except MS DOS, then either the A2000 (with bridge card) or A1000 (with sidecar) should fit the bill (transferring graphics will be a bit of a trick, but everything else shouldn't be to hard). If you want broadcast quality and can't wait a few months, then get an A1000, but if you can wait then it might be better to get an A2000. If you need 30, 40, 50 or more megabytes of disk storage and dozens of other high-priced peripherals but don't want to get more involved with the machine than writing the check, then buy an A2000 and your dealer will love you. If you want a super-micro workstation, 68020 with math co-processors and whatever else, then get an A1000 or A2000.

In this issue we look at desktop publishing on the Amiga: what it is, what is out there, what will be out there, and what to look for in desktop-publishing products. The Amiga is a natural for desktop publishing and there is finally a wide range of professional products for the Amiga. That being one of the last areas of software to be covered I think it is safe to say that if there is something that you want to do on a microcomputer, then the Amiga is the best computer for the job. And as all long-time followers of the Amiga know, there are a lot of things that the Amiga can do that no other computer can even pretend to do.■

Repartee

Comments, complaints and concerns

from AmigaWorld *readers.*

Disgruntled "Amigaite"

Regarding "1000 Uncertainties" in your Nov. Repartee column, it's cold comfort to know that I am not the only disgruntled Amigaite on this planet.

Commodore's offer of $1,000 for the upgrade to the 2000 is a sham. You get a bit more memory and PC compatibility for another $1,500 or more. And, in about a year, when Commodore decides to issue another upgrade, you will be left out in the cold once again due to the changes in the new system.

Your magazine is good, the computer, per se, is of the same quality. People who bought both are of normal or above average intelligence. It shouldn't take them long to realize that their Amiga 1000s have become obsolete not for the sake of new technology, but for the almighty dollar.

Commodore says that the 2000 is a business machine. What company would spend the money for a 2000 after looking at Commodore's track record?

Jim Audet
North Hollywood, CA

Amiga 3000?

When the Amiga 1000 made its debut, it represented a quantum leap in computer technology. It was state-of-the-art, dwarfing the Macintosh Plus and the IBM PC/AT in graphics, speed and multitasking; it blew them right out of the water!

A year later, the Macintosh II (powered by the 68020) and the IBM PS/2 80 (powered by the 386) were launched. Commodore's answer was the Amiga 2000. The 2000 offers true expandability, but the basic specifications and design was not improved at all, and to offer MS-DOS compatibility (now rendered obsolete by PS/2) seems a compromise to an inferior technology, a giant leap backwards. Commodore snatched defeat from the jaws of victory!

The Amiga has clearly become a technological laggard. The only thing going for it is its multitasking operating system, and even that minute lead will be lost when Apple and IBM introduce their own multitasking operating systems early this year.

If Commodore wants to be competitive in the business world, a more powerful computer is needed. Commodore should launch the Amiga 3000, a machine with a 68020, or preferably the newer 68030 processor, a 68881 math co-processor, a 68851 Memory Management Unit, more internal memory, higher density floppies, a CD-ROM drive, better graphics (read: higher resolution, no flicker), self-configuring expansion slot busses and, most importantly, Macintosh II and IBM PS/2 compatible co-processor cards.

The Amiga can *regain the technological lead it once enjoyed. Commodore is at a crossroads: To come up with a fast, powerful, number-crunching computer that will truly fill the needs of business, or to forever remain a home computer/video games company.*

Gerardo Arnoldo Tarango
Barksdale, LA

Positive Notes

After reading all the letters in the Nov. '87 issue from the disgruntled Amiga 1000 owners concerning the changes Commodore made in their two new machines, I felt that a few positive notes were in order. I've had my 1000 since April '86, so I believe I'm qualified to comment.

First of all, my machine has been very reliable. It sits on my desk at work and is usually on eight hours a day. I'm usually doing anything from marketing analysis, word processing and telecommunications to an occasional game to break up the pace. (Who says executives don't play games!) I have not had a single problem with any part of the machine.

Regarding future expandability, I would think that by now there is enough of an installed base of 1000s that there will be products available for some time. Personally, after I receive my hard drive next month, expandability will no longer be an issue at all for me. I'll have extra memory, two floppy drives, a hard drive and a modem. For what I do, it's all I'll ever need.

Gregg Haverly
Anchorage, AK

Building a Better Ball Game

I enjoyed reading Bob Ryan's article on Earl Weaver Baseball ["Boot Me Up to the Ball Game", Nov. '87, p. 38]. As much as I like Earl Weaver Baseball, I feel the game is not as good as it could be.

For starters, the infield fly rule is not supported and neither is the rule which forces relief pitchers to pitch to at least one batter before they can be removed. The "official scorer" is very inconsistent with its scoring—not assigning errors when it should, giving a batter a double on a single, etc.

The stat compiler has yet to work correctly for me. After compiling stats for a recent six-game series, one team showed more RBIs than its runs scored! Each team's batting stats don't match the other team's pitching stats (hits, walks, strikeouts).

It is my hope that Electronic Arts will address some of these concerns in a future revision of Earl Weaver Baseball. Unless they do, I'm afraid the ultimate computer baseball game is yet to be developed.

Nevin Longardner
Gahanna, OH

Let's Be PALs

How would you like to have a resolution of 620 × 512 with your Amiga? Well, all *European Amiga owners do, due to the European PAL TV standard. Good enough, but very few American video and graphics software developers have given this much consideration. This leaves us Europeans out in the cold, leaving the lower one-fifth of our screens blank. This is unacceptable for Amiga video production. I have yet to see PAL versions for Animator, DeluxeVideo, VideoScape 3D or DigiView, for instance.*

This problem has caused a great deal of trouble over here, and we hope to see future developments to support the rapidly growing European market.

Jon Bohmer
Norway

Send your letters to: Repartee, *AmigaWorld* editorial, 80 Elm St., Peterborough, NH 03458. Letters may be edited for space and clarity.■

NOTEPAD

Edited by Bob Ryan

AmiExpo Takes New York By Storm



A steady stream of AmiExpo visitors thronged the WordPerfect Corp. booth for a look at WordPerfect for the Amiga.

MAYBE FRANK SINATRA wasn't there, but the recently concluded AmiExpo seemed to have everyone connected with the Amiga whistling some spirited choruses of "New York, New York." The first all-Amiga exposition, held over the weekend of October 10-12, played to a full house and demonstrated conclusively that the Amiga is a force to be reckoned with in the microcomputer marketplace. With over 8,000 enthusiastic attendees jamming New York's Sheraton Centre exposition hall, it was clear the Amiga had passed with flying colors Old Blue Eyes' famous test: "If I can make it there, I'll make it anywhere."

Visitors to AmiExpo were beseiged with a host of new hardware and software offerings for the Amiga, including sophisticated graphics programs, genlocks, disk controllers, compilers and, of course, games galore. (For more information on many of the new products mentioned below, see this month's "What's New?" column.) Pundits as well as products were well represented, with a number of presentations, seminars and panel discussions available to fairgoers. Keynote speeches preceded each session of the three-day Expo, with Amiga pioneers Jay Miner and R.J. Michal kicking off the first two days and Commodore VP Richard McIntyre initiating the finale. (See "Old and New Guards Keynote Expo Sessions" on p. 11 for more information.)

Users Get Floored

After the keynote address each day, the show opened to the public. Many Amiga companies, both familiar and new, demonstrated their products to the public. While all the displays were busy, some drew an inordinate amount of attention.

NewTek principal Tim Jennison made a big splash with Digi-View and Digi-Paint, the company's Hold-and-Modify paint program. On display across the aisle was Progressive Image Technology's Super-Gen genlock (distributed by Digital Creations). Mimetics Corp. also showed off a new ImaGen genlock unit that was less expensive, although apparently of a higher quality, than the Commodore Genlock 1300. Although not displayed on the exposition floor, Burklund Associates' Genlock was being shown in a room in the hotel.

Perhaps the most startling graphics/video hardware was shown by Very Vivid of Toronto. The Mandala system uses a Live! digitizer to capture the image of a performer. It then uses collision detection to let the performer's image interact with objects on an Amiga display. The results are striking: You can paint, play music and even run programs just by waving your arms in front of a video camera. David Brae of Very Vivid promises both a high-end performance version and a home-user version of the product. He also indicated that the company plans to produce games based upon the Mandala system. This could give a whole new meaning to the term "interactive adventure."

Advanced graphics software seemed to be everywhere, with booths from Micro Magic (Forms in Flight), Aegis (VideoScape 3D), Byte by Byte (Sculpt 3D) and Impulse (Prism Plus and Silver). Desktop publishing software was also in abundance, as MicroSearch (City Desk), Gold Disk (PageSetter and Professional Page), Infinity (Shakespeare) and Brown-Wagh (Publisher 1000) all exhibited programs. Speaking of City Desk, SunRize Industries, the original developer of the program, was in action with its new real-time video digitizer designed to compete with Live!. Graphics junkies really got a good fix at the AmiExpo.

Music products were also in abundance at the show with booths from the likes of Magnetic Music (Texture), Sound Quest (DX7-11 Editors/Librarians), Aegis (AudioMaster) and Mimetics Corp. (SoundScape). Bob Hoover and Jeff Burger of Mimetics also presented one of the more instructive conferences by showing the evolution of a SoundScape song from conception to multimedia presentation.

No Amiga show would be complete without games, and many companies featured entertainment software at the show. Electronic Arts (Formula-1 Racing), MicroSearch (Head Coach), Firebird Licensees (The Pawn), Psygnosis (Terrorpods) and others presented many wonderful Amiga games. The most talked-about game was Arkanoid from Discovery Software. Based upon the arcade game of the same name, Arkanoid brings true arcade machine graphics and speed to a personal computer game. It promised to be the hit of the Christmas season.

Making The Hard Sell

Hardware vendors were at the show in force with many new add-ons for the Amiga. Perry Kivolowitz of ASDG showed his new SDP Hard Disk Controller. Available now in the Zorro I

configuration and coming soon in the A2000 Zorro II configuration, the SDP is a disk controller to end all disk controllers. It features both a SCSI controller and an ST-506 controller, a 68881 math coprocessor, a 512K memory cache and a 68000 processor that gives the controller its intelligence. The SDP uses its intelligence to keep often-accessed tracks in memory, to reorder the hard disk to reflect the frequency of disk access and even to make disk buffers appear contiguous for faster data transfer. It will also autoboot under the next version of the operating system now under development at Commodore.

One interesting aspect of the SDP is that although it performs DMA transfers to the memory cache, it uses an interrupt scheme to move data from the cache to the Amiga. This avoids a problem encountered with the Commodore A2090 Hard Disk Controller: Because overscanning the video display takes longer than normal video generation, overscanning interferes with the DMA part of the machine cycle. The A2090 will not work while the Amiga is in overscan; the SDP will. Although more expensive than other controllers, the SDP will surely be the choice of Amiga power users.

A unique hard-disk system was shown by Comspec. It features the ability to boot from the hard disk without the next version of the Amiga operating system and without any internal modification of the Amiga. Comspec was keeping its boot technique a secret.

Other interesting hardware included the 68020/68881 coprocessor boards from Computer Systems Associates and the A1000/A500 internal memory-expansion boards from Spirit Technology. The latter company raised some eyebrows with its internal memory board for the A500. Some Commodore engineers expressed reservations about the ability of the A500 to power any internal boards other than the A501 and work-alikes. Spirit claims the boards do not harm the A500.

The compiler wars heated up again as both Lattice and Manx showed new products. Lattice actually delivered version 4.0 of its C compiler at the show while Manx announced an upgrade to Aztec C. Manx also showed a source-level debugger for Aztec C that promises to cut development time considerably. The Spencer Organization showed an APL interpreter for the Amiga that should appeal to anyone who does serious number crunching with the Amiga.

The next AmiExpo will be held in Los Angeles, January 16-18, 1988, at the Westin Bonaventure. Call 800/32-AMIGA (or 212/867-4663 in New York) for more information.

Old And New Guards Keynote Expo Sessions

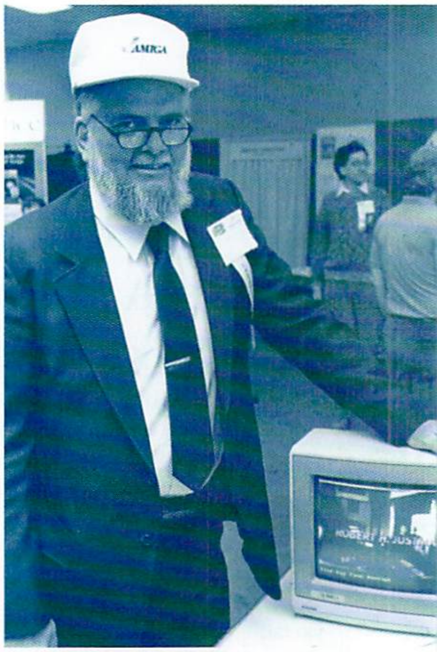
EACH SESSION OF AmiExpo opened with a different keynote speaker, beginning with Jay Miner, the person responsible for the concept and design that became the Amiga. Jay spoke about his background and about the founding of the original Amiga Corporation. He told how the original investors in the Amiga thought they were paying for the development of a video game machine while he and his team of hardware and software engineers were busy developing a high-end, graphics-oriented, general-purpose personal computer. Jay also related his motivation in designing and building the Amiga: He wanted to build a machine that could run sophisticated and realistic flight simulation software.

During his talk, Jay did not miss the opportunity to direct some pointed barbs at Commodore. While acknowledging the Amiga's debt to Commodore—Amiga Corp. would likely have filed for bankruptcy if Commodore had not bought the company—Jay expressed his anger at the way Commodore dismantled Commodore-Amiga and mishandled the marketing of the Amiga.

Looking to the future, Jay related that before Commodore-Amiga was closed down, it had completed the design of the next-generation Amiga custom chips featuring a 1,024-pixel horizontal resolution. He said he had no idea when Commodore might release a machine based upon the advanced chips.

Sunday's keynote address was delivered by R. J. Michal, the software engineer who designed and developed the Amiga's Intuition operating system. Like Jay Miner, R.J. spoke about what it was like during the early days of Amiga Corp. in 1983 and 1984. He spoke of the comraderie among the designers of the Amiga. His tales of the antics of the design team and his ad libs and one-liners also gave the audience an idea of how much fun it is to work closely with a group towards a common goal.

The final keynote speaker was Commodore Business Machines VP Richard McIntyre, the person curently responsible for the sales and marketing of the Amiga in the United States. He discussed the future of Commodore and of the Amiga. He also defended Commodore against the charge that it was abandoning A1000 owners, citing the generous trade-in policy for A1000 owners.



Amiga pioneer Jay Miner was the keynote speaker at the opening session of the three-day AmiExpo.

Upgrade Update

IN THE SEPTEMBER/OCTOBER Notepad (p. 12), I reported that one way to solve noise problems on the Amiga 1000 expansion bus was to take advantage of the PAL upgrade offered by C Ltd. I stated that the upgrade consisted of swapping Texas Instruments (TI) PAL chips for Monolithic Memories (MMI) PAL chips. In fact, the upgrade is just the opposite: TI PALs are replaced by MMI PALs.

Regarding another noise-reduction technique reported in the article, Comspec Communications reports that it has managed to run up to a half-dozen devices off the expansion bus by grounding the offending PAL chips together.

New CBM President

COMMODORE INTERNATIONAL announced that it has appointed Max E. Toy president and chief operating officer of Commodore Business Machines, the U.S. subsidiary of Commodore International. Mr. Toy comes to Commodore from ITT and has also worked for IBM and Compaq Computers in sales and marketing. Mr. Toy will report directly to Irving Gould, chairman and chief executive officer of Commodore International. With the appointment of Mr.Toy, Mr. Gould seems to be taking a step back from the day-to-day management of CBM. He had assumed executive control of CBM after the ouster of Thomas Rattigan last spring. ■

Hors d'oeuvres

Hints, tips and techniques from your fellow Amiga users.

Basic Syntax Debugging

After a bit of programming in Amiga Basic I came up with this handy idea for catching syntax errors. To help reduce (if not eliminate) syntax errors, I do all my programming in lowercase letters. This includes all variables I use in the program. When I get to the end of the line and press the Return key, all of the Amiga Basic reserved words are automatically capitalized. If I don't see a word go to all capitals, then it is either a variable or a syntax error that I can fix on the spot. This really speeds up debugging of syntax errors for me.

Jim Stewart
Venetia, PA

CTRL-L and CTRL-J

If you use the CLI a lot (like I do), then you must have noticed that once the screen is full, things start scrolling from the bottom to the top. I found it better when I can start with a clear screen, once the screen is full. To clear the screen, just use CTRL-L and then hit Return. This will clear the screen and allow you to start fresh.

If you wish to run a string of commands automatically, you can use CTRL-J. Just type each of the commands followed by a CTRL-J, and when you get to the end press the Return key. AmigaDOS will execute each command in order as if you had typed them one at a time.

S. Hardjopranoto
Gwynneville, Australia

Bargain Printer Stands

Rather than go out and spring for a fancy (and expensive) printer stand, I solved the messy printer paper problem simply and inexpensively. I went to a stationery store and bought a letter basket, the kind they use in offices for "in" and "out" baskets. Turn it over and it makes a dandy printer stand with the paper underneath and the printer on top. Mine cost a total of $2.49. If you have a larger printer you might have to get a legal-sized letter basket at a slightly higher price.

Thomas Meyer
Ames, IA

Editor's Note: All you Amiga 500 owners can use this tip for monitor stands. Not only will it elevate the monitor, but it will leave space for all the cables underneath.

1.2 CLI Diskcopy

As a hard core CLIer I was pleased to get the 1.2 upgrade but puzzled when I couldn't execute a Diskcopy from the CLI. After rummaging around a bit I found Diskcopy and Format in the System directory instead of the C directory (as it was in 1.1). If you want to use Diskcopy from the CLI, just copy it to the C directory. Using a BACKUP of the Workbench 1.2 disk, just type:

```
COPY DF0:SYSTEM/DISKCOPY TO DF0:C
COPY DF0:SYSTEM/FORMAT TO DF0:C
```

You may now execute these commands from the CLI.

If you routinely use RAM:C as your command directory, and attempt to format or copy a disk with the Workbench disk removed, requesters may appear asking you to reinsert the Workbench disk. One such instance is discussed in the Enhancer Software Manual accompanying the update (p. 28). A requester will appear if Diskcopy cannot access the file LIBS/icon.library, which is normally on the Workbench disk. If you have enough RAM to spare (approx. 52K), you can copy the LIBS directory to RAM:LIBS and avoid swapping disks. Once again, on a *backup copy* of your Workbench disk, modify the file s/startup-sequence so that you can use the C and LIBS directories from RAM by adding:

```
MAKEDIR RAM:C
COPY DF0:C TO RAM:C QUIET
ASSIGN C: RAM:C
MAKEDIR RAM:LIBS
COPY DF0:LIBS TO RAM:LIBS QUIET
ASSIGN LIBS: RAM:LIBS
```

If you still want to load Workbench, then insert these lines before the LoadWB line in the Startup-sequence. The use of QUIET prevents the names of the files being copied echoing on the screen. Note: the AmigaDOS Manual contains descriptions of the file editors available through the CLI.

Diane Engles
Colorado Springs, CO

Clearing Arrays

Often, an array in Amiga Basic must be reset to all zeroes. The obvious method is to use the sequence:

```
FOR a = 1 TO max : array(a) =
  0 : Next max
```

This is fine if "max" is small, but when "max" gets large, so does the time spent resetting each element one by one. A faster way is to use this:

```
ERASE array : DIM array(size)
```

This works because when Amiga Basic creates an array, all elements are set to zero. But you cannot create an array that already ►

exists, so first you must ERASE it. This will also work on string arrays.

Mark Wooge
Omaha, NE

Startup Multitasking

I use two techniques to customize my startup-sequence. These ideas allow you to automatically use the Amiga's multitasking and to run programs in the mode you desire.

To automatically use multitasking, I include the NewCLI command in the startup-sequence. An example of this is starting my public domain screen-blanking program, ScrnSave, during the startup. If you just include the name of the program in the startup-sequence, then the program will run, but the execution of the rest of your startup-sequence will be suspended. To fix this, run the desired program in its own window:

```
NewCLI CON:639/199/1/1 FROM
  s/screen–save
```

This will open a new one-pixel by one-pixel CLI window in the lower right corner of your screen and then run the command file "screen-save" located in the s directory. The file called screen-save is of the same format as your startup-sequence file but is much shorter. Mine says the following:

```
ScrnSave
EndCLI > nil
```

This file runs the screen-saver program (ScrnSave) and then closes the CLI window if ScrnSave is terminated. The EndCLI > nil statement is probably not necessary, but I include it anyway. The screen-save file is located in the s directory for convenience.

I also use the startup-sequence to run programs immediately during the system startup. My programs such as Images and Scribble! each reside on a disk of their own. Whenever I put one of these disks into my Amiga I obviously intend to run the main program. To do this automatically, simply modify the startup-sequence. For example, my Images startup-sequence reads:

```
Images
LoadWB
EndCLI > nil
```

This runs Images as soon as the machine boots. When I'm done using images, the startup-sequence automatically continues and loads Workbench. This will still allow you to run the program from Workbench. When running Scribble! in this manner I use the following:

```
Scribble! = 100 DF1:
```

This allocates 100K for the Scribble! files being edited and also tells Scribble! to find these files on the disk in drive DF1:.

Jim Stewart
Venetia, PA

Keyboard "Clicking"

Under 1.2 there is a keyboard shortcut for clicking on a requester box, allowing you to use the keyboard rather than the mouse.

Hold down the left Amiga key and press the V key to "click" on the left gadget (usually the Retry), or hold down the left Amiga key and press the B key to "click" on the right gadget (usually the Cancel).

Joerg Anslik
Cologne, West Germany

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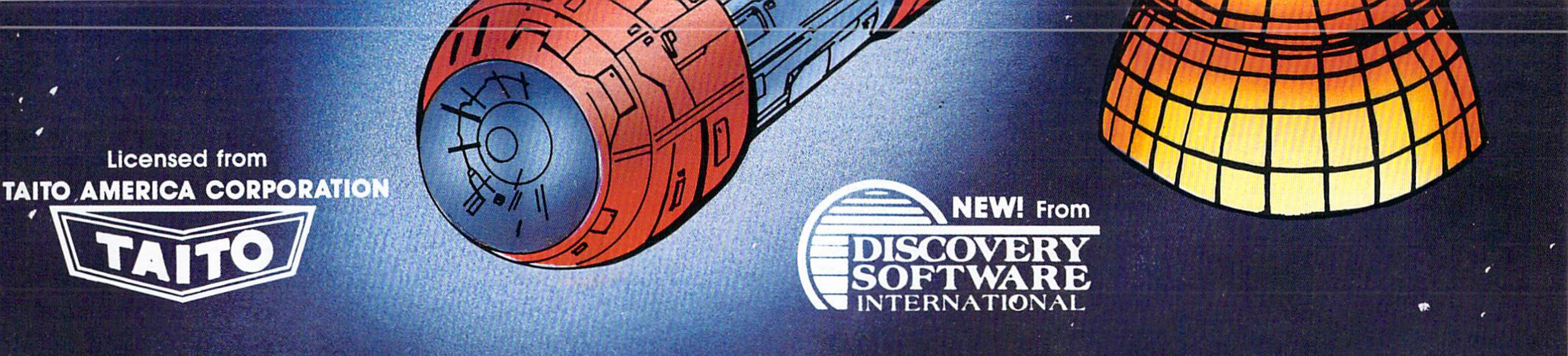
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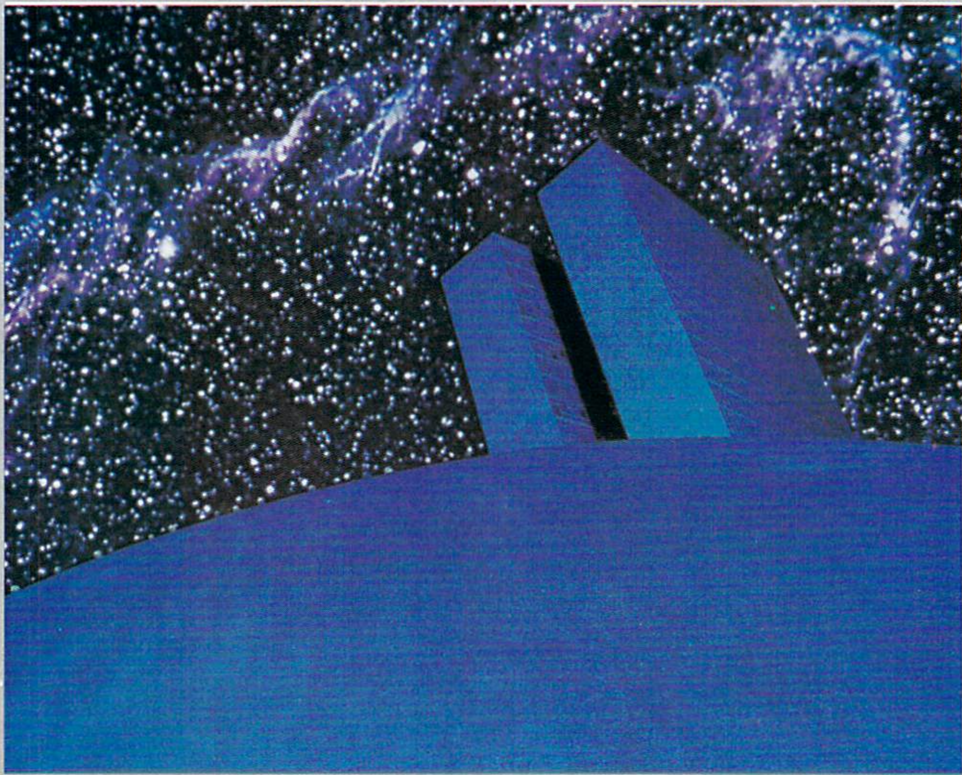
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BASIC By The Numbers

A tutorial on programming the Amiga with Amiga Basic. Part 1: First Steps

By Bob Ryan

1 Read Me First!

WELCOME TO THE *first part of* AmigaWorld*'s series on programming the Amiga with Amiga Basic. The series has two goals: to teach programming to beginners and to introduce Amiga Basic to those of you who have programmed in BASIC on other microcomputers. Each part of the series is divided into easy-to-digest chunks: Beginners should read every bit; more experienced programmers looking for Amiga-specific information can skip around at will. As space permits, I will include information about other flavors of BASIC available for the Amiga, such as True BASIC and the Absoft A/C BASIC Compiler.*

2 A Definition

CONTRARY TO WHAT most people think, programming a computer does not require a soaring intellect or a profound knowledge of mathematics. More than anything else, programming requires the ability and patience to tell the computer in excruciating detail how it will go about solving your problem. You see, computers are incredibly dumb; they can only perform the most rudimentary functions, such as "move the information at address $50000 to register D6" or "compare the information at address $12010 with the information at address $12012." If it were not for the fact that computers are also incredibly fast—their saving grace—they would be little more than intellectual curiosities.

To program a computer, you enter into it a list of instructions that it then executes. You cannot assume the computer knows what you want to do; it simply *and exactly* does what you tell it to do. To be a good programmer, you have to tell the computer the right things to do in the right order.

3 Basic History

YOU PROGRAM a computer using a programming language. Each computer language has strengths and weaknesses—FORTRAN, for instance, is great for writing math-heavy programs but horrible for manipulating text information. BASIC is renowned as a language that is easy to learn and use. In addition, newer versions of the language, such as Amiga Basic, have many powerful features normally associated with more complex languages. Amiga Basic is not a wimp language—you can write very powerful programs with it.

BASIC is an acronym for Beginner's All-purpose Symbolic Instruction Code. First developed by John Kemeny and Tom Kurtz at Dartmouth in the early 1960s, it uses an English-like syntax (meaning there is some common-sense correlation between the names of BASIC statements and the functions they perform). PRINT, for instance, will cause something to be printed on the screen (just as you would expect) and can handle many different types of problems.

BASIC became very popular on early microcomputers because it could be squeezed into their tiny memories (in 1976 4K of RAM was considered a lot of memory). Amiga Basic, written by the Microsoft Corporation, is a direct descendant of those early microcomputer BASICs.

4 Window on Amiga Basic

YOU WILL FIND Amiga Basic on the Extras disk that came with your Amiga. (On the disk, it's actually called AmigaBASIC—no space.) Amiga Basic is itself a program; its function is to accept instructions from you in the form of Amiga Basic statements and to then translate these statements into the low-level instructions the Amiga can understand. You start Amiga Basic by double-clicking on its icon. If you have two disk drives, you can run Amiga Basic from your external drive. If you have only one disk ►

drive, you can remove the Workbench disk and insert Extras. If you want to avoid one-drive disk swapping, you can delete unimportant files from your Workbench disk and copy Amiga Basic to your Workbench disk. (See "Clear the Bench," *AmigaWorld*, Nov. '87, p. 61, for details.)

Running Amiga Basic brings up two windows on your Workbench screen. The LIST window is where you enter and modify your BASIC programs. When you choose Start from the Run menu (or type in Run in the BASIC window), Amiga Basic will execute the instructions displayed in the LIST window.

The other window is the BASIC window. Unless you specify otherwise in your program, the output from the programs you enter into the LIST window will be displayed here. Try this example: Select the LIST window (by clicking the left mouse button while the pointer is in the window), type in "PRINT 10 + 10" and hit the return key. (Just enter what is between the quotation marks; the marks themselves and everything outside them are not part of this BASIC statement.) Now choose Start from the Run menu and observe what happens.

If you enter everything correctly, your LIST window should disappear and the number 20 should appear in the upper left of the BASIC window. Then, the program completed, the LIST window should reappear. If this does not happen, correct the statement in the LIST window and run the program again.

In addition to being the standard output window, the BASIC window has a second function. You can use it instead of the pull-down menus to do such things as load, run and stop programs. For instance, in the above example, instead of selecting Start from the Run menu to run the program, you could select the BASIC window and type "run" and hit return. Commands entered into the output window are called immediate commands. By comparison, True BASIC, another version of BASIC for the Amiga (available for $99.95 from True BASIC Inc., 39 South Main St., Hanover, NH 03755, Tel: 800/TRBASIC) has three windows: a list window, an output window and a command window. Amiga Basic combines these last two into one window. From now on, when you run a program, you can do so with either the pull-down menus or an immediate command.

5 Hello World!

I'VE READ A LOT of books on programming and taken a lot of computer courses, and it seems that the first program beginners are instructed to write is one that either displays their name or the message "Hello World" on the screen. I've opted for the latter.

Select the LIST window and enter the following:

```
REM My First Program
  LOCATE 5,10
  PRINT "HELLO WORLD"
  FOR X TO 5000: 'a pause loop
  NEXT X
  END
```

Run the program and watch as it prints your message in the output window.

Let's look closely at what's happening here. The first line of the program begins with the key word REM, indicating that this line is a remark and is not meant to be executed. Remarks (also called comments) are used by programmers to document a program. They are only visible when you list the program, and they are good reminders of what functions are taking place in different parts of your program. Many times, you will want to modify a program that you wrote months ago. Without remarks to tell you what sections of your program do what, you might not be able to figure out the logic of your own program!

The second line of the program is the first line that is actually executed. The LOCATE statement positions the cursor on a particular line and column of the output window. In this case, the cursor is positioned at line five and column ten of the BASIC window. LOCATE is an example of an output statement; it changes the output window of the program. Although it does not write anything in the output window, it does change where information will be written. You use this statement to format your output window.

The PRINT statement in line three is another output statement that writes whatever is found between the quotes to the current output window at the current cursor position. In addition to displaying what is between quotes, PRINT statements are also used to display numbers, numeric variables and string variables. (More on variables later.) In addition, depending upon whether the item to be displayed is followed by a semicolon, a comma or a blank space, the PRINT statement will position the cursor one position to the left, one tab to the left (as set by the Width statement), or at the beginning of the next line, respectively. Check your Amiga Basic manual and experiment with all the different variations of the PRINT statement.

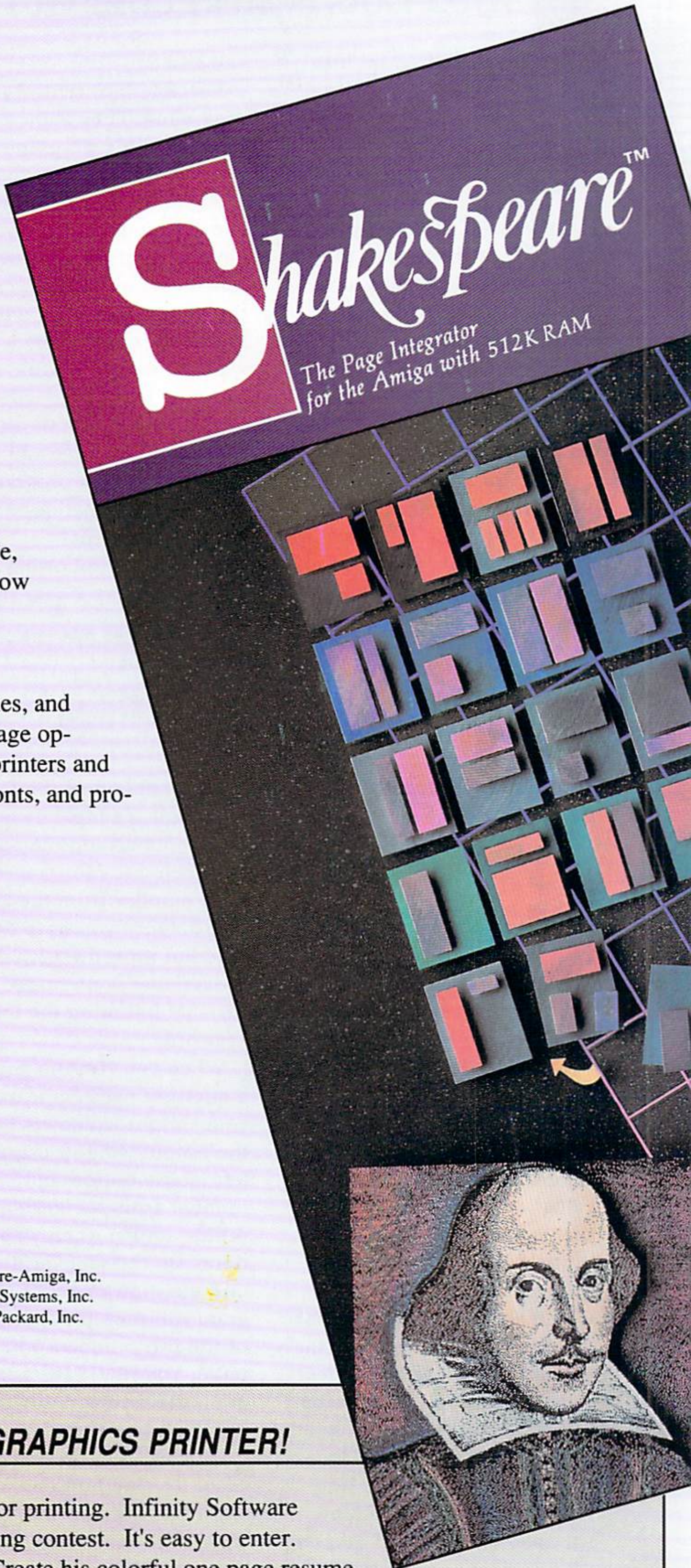
The next line is the beginning of a FOR/NEXT loop. Loops are fundamental to programming; they let you execute the same statements over and over again. Although I will cover loops more extensively next month, you should know that this line initiates a loop that will execute what is between the FOR statement and the corresponding NEXT statement 5000 times. After the FOR statement comes a colon. A colon indicates the end of a statement: It allows you to put more than one statement on a line. Following the colon is an apostrophe ('). This has the same function as REM; it sets off a comment.

The NEXT statement indicates the end of the loop. You will notice that this loop has no executable statements between the FOR and the NEXT. The only purpose of this particular loop is to pause the program before ending it. You can lengthen the pause by replacing the 5000 in the FOR statement with a larger number. The final line contains the END statement that marks the end of the program.

This program is not very impressive, but it does illustrate one of the more fundamental things about programming: programs execute one statement at a time, one after the other. Although you can use loops and other control statements to determine which statement is executed next, you cannot execute two or more statements at once. ►

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6 WHAT GOES IN MUST COME OUT

ENTER THIS program into the LIST window. . .

```
REM Add Two Numbers
PRINT 2+2
END
```

. . .and run it. It adds two plus two. The problem with the program is that it adds only two plus two. To add two other numbers, you have to modify the program in the LIST window. There is a better way, and it involves variables and the INPUT statement.

In the program, the two twos are called constants. The Amiga stores the numbers in specific memory locations and then performs the indicated function—addition, in this case. A variable is like a constant, in that the computer sets aside memory to store a value, but that value is not set in concrete—it can change according to your needs. Try this program:

```
REM Add Two Numbers
num1=2
num2=2
PRINT num1+num2
END
```

This program gives the same results as the one above, but we have used variables, num1 and num2, instead of constants. Variables have two components, a name (or label) and a value. This program assigns values to two variables and then adds the values represented by the labels. To change the program, you would change the assignment statements. Note well that the equals sign in the assignment statements should be read as "takes the value of," not as an algebraic equivalence. For example, you would read line two of the program as "the variable named num1 takes a value of 2."

Variables are critical in programming. They allow you to create flexible programs that can handle different data. That is not apparent in the above example, where you have to change two assignment statements in order to change the numbers that get added; but if you could change the value of variables while the program is running, you would have a flexible addition program. Assigning values to variables while a program is running is a function of the INPUT statement.

Type in the following program:

```
REM Add Two Numbers
INPUT num1
INPUT num2
PRINT num1+num2
END
```

The function of the INPUT statement is simple: It types a question mark on the screen and then waits for you to enter a number from the keyboard. Once you have done that and hit return, it assigns the number you entered to the variable following the INPUT keyword.

When you run this program, a question mark appears on your output window. Click on the output window using the left mouse button and enter a number from the keyboard, hitting return when you are done. Do the same at the second question mark. The program will then print the sum of the two numbers you entered. You now have a program that will add any two numbers you enter.

(By the way, if you are interested in a method that allows you to activate a window for input without clicking the left mouse button, see this month's "Help Key" column.)

7 THE STRING SECTION

NUMBERS ARE NICE, but the power of digital computers comes from the fact that they can manipultate text information—names, addresses and the like—just as easily as numbers. Amiga Basic has a special type of variable for storing text information: the string variable. Unlike the numeric variable we used in the example above, string variables require a special extension—a dollar sign—to tell the Amiga that they are being used to store alphanumeric characters and not numbers. Examples of string variables are name$, answer$, state$, c1$ and rec.in$.

String variables do not have a specific length; they expand and contract based upon the characters you put into them. An assignment such as *name$="Bob Ryan"* results in a string that is eight characters long. If, later in the program, you assign a different string to the same variable (*name$="Roger Clemens"* for instance), the variable will expand automatically to hold the extra characters.

Like numeric variables, you can use string variables in PRINT and INPUT statements. You can also add strings together in a process called concatenation. Enter and run the following program:

```
REM Strings and Things
INPUT "Enter your first name:    "; first$
INPUT "Enter your last name:     "; last$
fullname$=first$+" "+last$
PRINT fullname$
END
```

This program introduces a couple of new twists. Notice that the literal strings enclosed in quotes in the two INPUT statements print before the program will accept input from the keyboard. This is how you can display more detailed and informative prompts than a mere question mark. The semicolon after the literal has the same effect in an INPUT statement that it does in a PRINT statement: It moves the cursor to the next column on the output window. This is where you see the data you enter displayed.

After getting the data into variables, the program concatenates the strings in line four. Three strings are being combined here: the string variables first$ and last$ and a literal string. The literal string may look empty, but it is not—it contains the space character (there is a single space between the quotation marks). I used the space to keep the first and last names from running together when they are combined. Line five simply prints the concatenated string.

8 WRAP UP

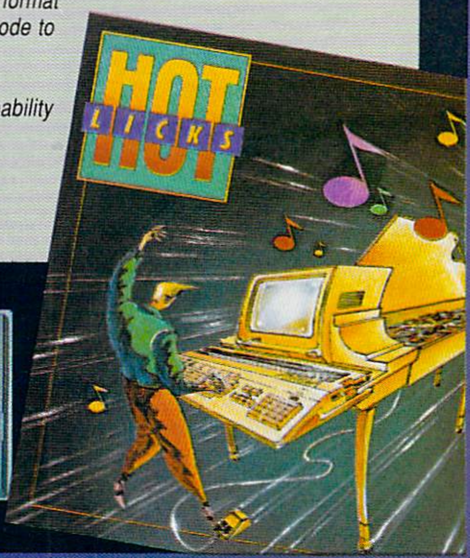
NEXT ISSUE *I'll go into detail about loops, control structures and conditional branching. In the meantime, use your Amiga Basic manual to learn more about PRINT, INPUT and variables. If you have any questions about what I've covered here, or if you have a particular topic you would like covered in a future installment of the series, write me at BASIC By The Numbers,* AmigaWorld *editorial, 80 Elm Street, Peterborough, NH 03458.* ■

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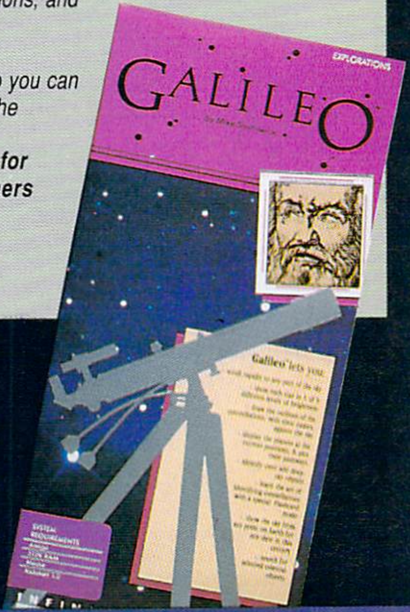
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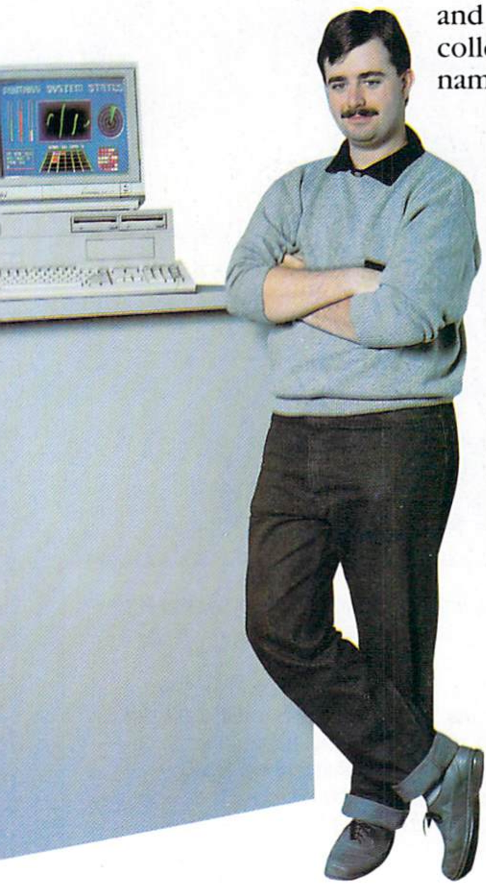
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TO HAVE & HAVE NOT

AMIGA DESKTOP PUBLISHING SOFTWARE

IF DESKTOP PUBLISHING had been around 50 years ago when Ernest Hemingway was writing his powerful novel about hard-boiled Harry Morgan smuggling rum and refugees in pre-War Cuba, Hemingway would not have joined the throng of PC-clonesters to produce this novel. Always the iconoclast, he would have stayed with his more innovative and individualistic Amiga.

Desktop publishing programs for the Amiga may not have all the features or frills of Mac and PC offerings, but the gap is beginning to narrow as market momentum starts to build.

Alas, although a great admirer of both Hemingway and my own Amiga 1000, I parted ways with "Papa" last spring and bought an IBM-AT compatible computer. Not because I had any fondness for MS-DOS or had tired of my Amiga 1000. Quite the contrary. In order to establish a document-design business based on desktop publishing technology, I had to face the fact that software sophisticated enough to fill my needs, such as Ventura Publisher and PC-PageMaker, was not available for the Amiga. ►

By Chris Dickman

ILLUSTRATED BY PHILIPPE WEISBECKER

At that time, PageSetter 1.0 was the sole Amiga desktop publishing program available, and while a valiant first effort, it came up short of its big-league counterparts in an alarming number of categories. The fullness of time has seen the release of a new version of PageSetter and its companion programs, LaserScript and Jet, as well as a number of competitors. Recently announced products indicate some directions Amiga desktop publishing software will be following, building on the Amiga's inherent strengths to provide color separation and sophisticated image processing capabilities as well as many of the features found in high-end MS-DOS and Macintosh programs. In the sidebar ("On the Horizon") below, we will take a quick peek at one or two of these soon-to-be-released programs and check out their advanced billing.

COMPARING THE CURRENT CROP: 5 CRITICAL TESTS

If you need the power promised by this new generation, you might consider hanging on to your wallet. If you are new to desktop publishing, however, and just want to get your feet wet or have documents that just can't wait, despite the limitations of the current crop of software, there are several offerings from which to choose. With that in mind, let's compare the salient features of Publisher 1000 (Brown-Wagh Publishing), PageSetter (Gold Disk Inc.) and City Desk (MicroSearch Inc.) in light of their performance in five critical areas.

1. FILE IMPORT ABILITIES

Because the central function of desktop publishing software is the integration of text and graphics files, poor performance on this score can cripple a program. Publisher 1000 performs credibly, supporting Notepad (ASCII), Textcraft and Scribble! files. As with all of the programs under review, it can also import IFF graphics files, converting them from color to black and white if necessary. City Desk handles Notepad and Scribble! files, with WordPerfect support promised in the future. In addition, font and style changes inserted in the file, such as underlining and boldfacing, are maintained when importing Notepad files. PageSetter can import Notepad, Scribble! and Textcraft files.

2. FLOWING TEXT

The relative ease with which a desktop publishing program places, or "flows," the imported text on the page has a big

ON THE HORIZON

NOT CAPTIVATED BY the current crop of Amiga desktop publishing software? The good news is that a new generation is set to arrive that makes better use of the strengths of the Amiga's unique hardware and software mix. Two prospective members of this group were to have been released at the end of 1987, and although I did not have copies in hand before this article went to press, I did have some advance information, and, in one case, a late beta version.

Shakespeare: The Page Integrator (Infinity Software, 1144 65th St., Suite C, Emeryville, CA 94608; tel: 415/420-1551; expected list price: $225; requires 512K) promises users the ability to create long documents containing full-color IFF graphics. Supplied on two disks containing an extensive library of page templates and clip art, the program provides solid support for PostScript printers. This includes the ability to directly download PostScript code, thereby opening up a new world of typographical special effects to Amiga owners.

Professional Page from the makers of PageSetter (Gold Disk—see Product Information box; expected list price: $395) promises to be the *ne plus ultra* in Amiga desktop publishing. In fact, it goes beyond this, providing features not found in desktop programs written for other microcomputers. Consequently, its hardware requirements are quite steep: It will take 1 MB of RAM (2 MB is better), two disk drives and a PostScript printer just to get you in the game. As the program runs in interlace mode, a high-persistence monitor would also be a good idea.

Judging from an advanced beta version, it appears to me that Professional Page is based on PageSetter but goes far beyond it in capability. For example, instead of a separate text editor, there is now a WYSIWYG version that lets you edit text right in its box. Text control is now more complete with the addition of hyphenation, variable tracking, baseline control and kerning. Also, you now have five different page magnifications, can create oversized pages, employ page templates and use PostScript printers.

It's in the area of graphics, however, that Professional Page has really made a giant leap forward. It is the first Amiga program in this category to support object-oriented graphics, such as those produced by CAD software. It provides a full complement of tools to create or edit this type of graphics, including the ability to draw the Bezier curves employed by the popular Macintosh Illustrator program. It also extends Bitmap graphic support to the point where Professional Page can import IFF or HAM graphics and display them on the screen in sixteen shades of gray. It enhances color support even further through an individual color-separation module that can divide any Professional Page or IFF file into cyan, magenta, yellow and black for offset printing purposes.□

—CD

The ease with which

a desktop publishing program lets you modify

text is a good yardstick

of the program's sophistication.

impact on productivity. Most such programs, including the three under review, deal with text in terms of blocks, called linked boxes by PageSetter, boxes by City Desk and guides by Publisher 1000.

To place a text file on a PageSetter page, you must create a blank box on the screen by clicking and dragging the mouse. After loading the file, you click in the box to fill it with text; to fill multiple columns or pages with a long text file, you must reflow every box manually by clicking in each one. These linked boxes form part of a chain; resizing one box thus reflows the text automatically in the other links of the chain, a feature unique to PageSetter. Boxes can be linked or unlinked from the chain as desired, providing quite a bit of flexibility. PageSetter is also the only program of the three that displays the actual text when you move a block; the others display only the outline.

Publisher 1000 works basically the same way, with text placed in columns or guides drawn on the screen. The program also reflows text manually, but it uses a somewhat less intuitive process than that of PageSetter; you have to pull down the Edit menu to Continue, then click the first text box, then the one in which the text is to be reflowed. A text file can be split into any number of boxes spanning columns and pages, but the boxes are not linked dynamically. You can move or size them easily, but there is no procedure to unlink them.

City Desk takes a slightly different approach. You do not have to place loaded text in a previously created box; instead, you can dump it anywhere on the page, thereby forming its own box. You may reflow long text files either manually or automatically throughout a document and they will remain linked, albeit in a confusing manner. When you make a text box smaller, for example, rather than the extra text flowing into one of the other linked boxes, the pointer changes to indicate it is loaded with the surplus text, which you must place somewhere before you can continue. This is messy, despite the fact that you are able to link or unlink boxes from the chain.

3. Modifying Text

One of the claims to fame of desktop publishing software is its ability to modify text by changing its size, typeface, alignment and attributes. The ease with which it does this is a good yardstick of the software's sophistication. Ideally, you should be able to make such changes both to blocks and individual words. City Desk encourages you to change such text attributes as alignment, typeface and size a block at a time. To enlarge page elements such as headers thus forces you to break a document into many separate chunks—a dismal task at best. An alternate route is to load a block into the program's rather weird editor, which displays the text as one long, scrollable line. Into this you can insert up to fifty different commands to control everything from font type, size and attribute to widow and orphan line checking. The problem here, however, is that although you can make multiple changes within a text block, you will need to work with embedded codes, a task perhaps more appropriate to high-end, dedicated typesetting machines than your personal computer.

PageSetter follows a similar approach, whereby typeface, font size and so forth are controlled in block moves. With this program, fortunately, it is relatively simple to cut out part of a text block for individual treatment. You may also load blocks into a competent, full-screen editor and apply a limited range of embedded formatting codes to individual words; these include the unusual outline, shadow and reverse commands.

Publisher 1000 also forces you to perform most text operations a block at a time. This is all the more frustrating in that it is the only one of the three programs that wisely forsakes a separate text editor, allowing you to edit the text—and even to change attributes such as boldface or italics—right on the screen. Despite this feature, you are still stuck with the inability to change typeface or size within a block. The block move operation itself is not an easy process, as the screen responds slowly and the cursor is almost invisible. Close but no cigar.

4. Control of Views

Views are the different levels of magnification at which the page is displayed. Being able to move smoothly among them is essential, because the process of page composition is a continuous reversal between zooming in to work on a detail and pulling back to see the entire page. Each of the three programs uses a slightly different approach.

City Desk relies on a pop-up gadget that can be set at a magnification level between one and six, with the latter setting required to read 10-point type. The zoom is not pointer-sensitive, however, so that once you enlarge the page, you must use the scroll bars to move to the part of the page you were working on. (None of the programs, for that matter, permit zooming a specific area of the page.) A function key to toggle between one and six would have been preferable in this case.

PageSetter lets you rotate among three views of a page simply by clicking on a magnify icon. In place of scroll bars, it employs a strange little gadget off to the edge of the screen to allow you to move around the page. This is an unusual but workable arrangement.

The best of the lot is the elegant approach employed by Publisher 1000. It provides only two views: the entire page and a highly magnified fragment in which you navigate with the aid of scroll bars. Working at the highly magnified view for long lengths of time is possible, because, unique to Publisher 1000, the screen scrolls quickly and smoothly and does not redraw as you move about the page. It even scrolls with you when you size or move graphics or text blocks. Although the process eats up a lot of memory, it is an enormous aid to production. Even when a full-page view is required, the magnified view pops up on top of the expanded view before vanishing with a click of the mouse—quite a neat feature. ►

DESKTOP PUBLISHING VS. SLICED BREAD: RAGING 'BULL' OR REAL CONTENDER?

By Eric Grevstad

IT'S DOUBTFUL desktop publishing could have flattened Dempsey or Tunney, Lewis or Marciano, Ali or Frazier. However, it can definitely KO the typing pool, decision the Xerox machine and go the distance with the copying center next door. But, the buffs and the bookies ask, can it really be a contender in the print game?

Strictly speaking, using a personal computer to design pages combining text, headlines and graphics is a vertical application; it affects fewer people (whose jobs involve page layout) than the advent of word processing affected secretaries or the spreadsheet affected financial planners. Be that as it may, there are some intriguing numbers to consider. *The New York Times* recently quoted Jonathan Seybold, of *The Seybold Report on Desktop Publishing*, as estimating that more than 300,000 programs will have been sold in 1987 (compared with 60,000 in 1986). Another such increase in 1988 would guarantee desktop publishing a formidable niche in the personal computer marketplace.

Desktop publishing may offer the same promise that Johannes Gutenberg's movable type did in the 1450s. Gutenberg was not the inventor of movable type (the Koreans had nearly identical presses a century earlier), but he was the first to make the printed word widely available in the vernacular (the Koreans printed only Chinese classics for the royal court). Like Gutenberg, desktop publishing could make printed communication available to more people at lower cost.

Gutenberg Invents ASCII

Actually, the kind of printing perfected by German goldsmith Gutenberg resembles most of today's word processors. Gutenberg's impact printer pushed paper against a frame holding an inked rack of type, raised letters and symbols arranged line by line to spell the desired text.

It was more efficient than its predecessor—a wooden block painstakingly carved with all the letters on a page— because it broke down the document into rearrangeable, reusable characters. So does ASCII (American Standard Code for Information Interchange), the computer shorthand that lets one byte (the decimal value 65) stand for a capital *A*, another byte for *B* and so on. It's much simpler for software to slap the letter *A* on screen than to draw it as a pattern of pixels in a bit-mapped graphics image.

The leading character-based desktop publishing device is something Gutenberg would recognize easily: a daisy-wheel printer. Daisy wheels' scant variety of fonts or typefaces can be supplemented by dot-matrix printers, but their text looks like, well, a matrix of dots—low-quality output, rarely suited for newsletters or reports.

Meanwhile, however, the art of printing has in some ways moved back toward the carved block of a whole page. From racks of "hot type," print shops have gone to techniques like offset printing and lithography—the transfer of an image such as a page to a metal plate or drum, different areas of which attract and repel the ink that copies the image to paper. Desktop publishing is sometimes called page publishing or document processing because it follows this path, seeing the big picture instead of working one character at a time.

Desktop Horsepower

Most word processors can edit ASCII text files sprinkled with imbedded codes like {cm} or {ep}, which a typesetting machine can translate into instructions to change fonts or indent paragraphs. This is still a widely used practice, if unrelated to today's WYSIWYG (what you see is what you get) trend; it's how *AmigaWorld* sends text via modem to the typesetter. Yet, what most people call desktop publishing did not begin until 1984, with the advent of the laser printer and the Apple Macintosh.

Laser printers, which work like photocopying machines (a photoconductive drum attracts toner to printed areas of an image), offer superior speed and resolution—usually 300 dots per inch (dpi) compared to matrix printers' 75 or 150. This is good enough for most newsletters, business presentations or brochures, although most programs also support dot-matrix printers for drafts or simple jobs.

The fanciest publications or users determined to avoid "jaggies"—slightly jagged edges of big letters—can buy one of the expensive new 600-dpi lasers, take 300-dpi output and photographically shrink it 50 percent to get the same effect, or they can send their files to a real phototypesetting machine, such as an Allied Linotronic 100, and receive over 1,000-dpi quality.

As for the Macintosh, it got people accustomed to bit-mapped, graphics-based computing and it remains the belle of the desktop publishing ball, although Amiga and MS-DOS systems are catching up. Just as significant has been Apple's LaserWriter, which set the standards for powerful laser printers with its own 68000 processor and page description language, Adobe Systems' PostScript, built in. A page description language is a sort of specialized super-ASCII, a

compromise between limited character codes and the brute-force approach of drawing an 8- by 10-inch page as 7.2 million dots. PostScript combines sophisticated graphics control with flexible, memory-efficient font management.

Even with PostScript, both computers and printers need ample memory and power to handle millions of dots instead of a few thousand text characters, taking over jobs held by the $30,000 Unix workstations used in professional page layout systems from such firms as Xyvision and Interleaf. The 68020 CPU should be desktop publishing's greatest hit; most of today's MS-DOS page programs already require an 80286 or 80386 system instead of a plain PC.

Words and Pictures

Desktop publishing combines on a computer screen the jobs of page layout and paste-up and gives this work the convenience of word processing. It makes it easy to change things, to see how a headline would look in larger type or to drag a paragraph with a mouse instead of peeling it from beneath its Scotch tape. It draws straight lines for you. It lets you zoom in on a corner or see a view of the whole page. And it saves your finished composition as a disk file, ready for the laser printer or phototypesetter.

What desktop publishing programs do with text is a continuation of the formatting done by good word processors. The latter can go beyond the crude, insert-extra-spaces justification used to align the margins of mono-spaced text (where every character has the same width, such as $\frac{1}{10}$ inch) and support proportional spacing (where an *i* is skinnier than an *M*). Desktop publishing programs, whether importing a word processing file or letting you type words directly, add extra precision in pouring text into columns or wrapping it around a protruding piece of art, with typesetter-style control of features like kerning (adjusting the space between letters, moving an *o* under an overhanging *T*) and leading (spacing between lines).

Desktop publishing programs also support many different fonts—Times, Bookman, Helvetica, Palatino, Zapf Chancery and so forth—in styles such as roman (regular), bold and italic, and in different sizes. Fonts and spacing are measured in points ($\frac{1}{72}$ inch), other page areas—such as line or column length (measure) and margins—in picas ($\frac{1}{6}$ inch). Most word processors support superscripts or subscripts; desktop publishers add such options as drop caps (extra-large capitals, extending below the first line of text, for the first letter in an article, a holdover from medieval manuscripts).

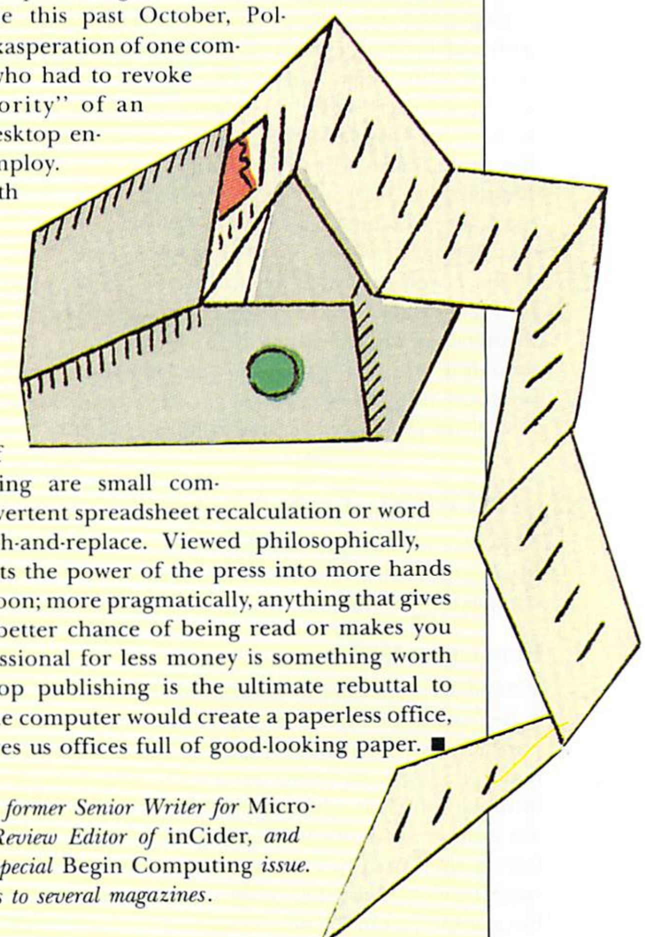
Desktop publishing does not yet support color printing, aside from the advanced labor of making different versions or portions of a picture as four-color separations to be overlaid at the print shop. There are, however, many ways to merge graphics with type: importing clip art or files from drawing or painting programs, or artwork or photos converted to binary files by a digitizer or scanner.

What It Means

Points, picas, kerning, leading, halftones—all are terms and concerns of conventional publishing. The only difference with desktop publishing is that laying out a page on screen instead of on a drawing table gives much more flexibility for making changes and playing the designer's equivalent of spreadsheet jockeys' "what-if" games. Put that graph a few inches lower, split that column with a boxed quote, try the whole thing in two columns instead of three, use the "undo" command if your creative genius gets out of hand.

Page design, like drawing or sculpture, is hard. The great advantage of desktop publishing is that many individuals, community groups and businesses can save time and money by producing printed material themselves instead of hiring it out. This can result in substantial savings for such everyday office items as in-house bulletins, ads, announcements, forms, flyers, brochures, menus and letterhead. With larger, more complex undertakings—annual reports, magazines, books—the economics may be outweighed by considerations of quality and professional appearance.

For any task, however, the drawback of desktop publishing is that it cannot turn copywriters into artists, or executives into paste-up aces. Too many novice desktop publishers commit the same sin of mouse-driven word processor owners—font abuse. Such users—or abusers—can produce documents that, in the words of computer trends reporter Andrew Pollack, "resemble pasted-together ransom notes." In a *New York Times* article this past October, Pollack related the exasperation of one company executive who had to revoke the "font authority" of an overly eclectic desktop enthusiast in her employ. Combine that with all the cute clip art cartoon figures ready to be peppered all over a page, and the mind reels.



Still, the potential dangers of desktop publishing are small compared to an inadvertent spreadsheet recalculation or word processing search-and-replace. Viewed philosophically, anything that puts the power of the press into more hands is a democratic boon; more pragmatically, anything that gives your message a better chance of being read or makes you look more professional for less money is something worth following. Desktop publishing is the ultimate rebuttal to those who said the computer would create a paperless office, but at least it gives us offices full of good-looking paper. ■

Eric Grevstad is a former Senior Writer for Microcomputing *and Review Editor of* inCider, *and edited* inCider's *special* Begin Computing *issue. He now contributes to several magazines.*

5. Font Support

The trio differs widely when it comes to font handling. Publisher 1000 takes the most simplistic approach by assuming you will be printing with a dot matrix printer. To its credit, in addition to two Amiga fonts, it supplies a handful of others that not only print fairly well but are highly legible on the screen. More fonts are available on a separate disk. As for the Amiga fonts, the less said about using these for desktop publishing the better.

City Desk covers all the bases, providing support for matrix, PostScript and Hewlett-Packard laser printers. To be frank, it makes little use of the power of PostScript, as only a few typefaces and sizes are available. The same is true of its handling of the H-P LaserJet, because only two of its font cartridges are supported. A full complement of cruddy Amiga fonts is supplied, which look predictably foul on the screen and print almost as badly. Who designed these clunkers, anyway?

PageSetter was designed originally with matrix printers in mind and comes with just the Amiga fonts. For some reason they display better than their counterparts in City Desk but print much the same. Extra fonts, including such standards as Helvetica and Times Roman, are available on a separate Fontset disk. Things get more interesting, however, with the addition of the LaserScript and Jet utility programs, which let you print PageSetter documents with PostScript and H-P LaserJet printers. Again, the range of fonts and sizes is limited, although a utility is provided to resize fonts as needed. The program does allow you to get at such meaty aspects of PostScript as combining and rotating pages.

PRODUCT INFORMATION

PageSetter 1.1e
Gold Disk Inc.
PO Box 789
Streetsville, Ont. L5M 2C2
Canada
416/828-0913
$149.95
Requires 512K

Publisher 1000 1.0
Brown-Wagh Publishing
16795 Lark Ave., Suite 210
Los Gatos, CA 95030
408/395-3838
$199.95
Requires 512K

City Desk 1.0
MicroSearch Inc.
9896 Southeast Freeway
Houston, TX 77074
713/988-2818
$149.95
Requires 512K (2 MB recommended)

STRENGTHS AND WEAKNESSES

Now that we have put our three programs through a battery of separate tests, let's see how they stack up in an overall comparison of features and performance.

Publisher 1000

While lacking a number of desirable features, Publisher 1000 is the easiest of the three to master and work with, in large part because of its smooth page scrolling, simple movement between views and uncluttered screen display. Its manual is minimal but clear, although the typos and spelling mistakes are annoying. While the package is short on frills, it does have a nice pattern editor utility which can be run at the same time as Publisher 1000 to create patterns for filling lines or boxes. On the negative side is the program's frequent disk accesses, lack of laser printer support and absence of a graphics editor. But if you will be creating documents with a matrix printer, are willing to invest in more fonts and value the program's lean-and-mean feel, Publisher 1000 could be for you.

City Desk

The only program under review with built-in support for matrix, H-P and PostScript printers, City Desk is also unique in providing the ability to flow text automatically throughout a publication. This should make it the clear choice for working with lengthy documents, but its superiority here is tempered by its relatively clumsy handling of text blocks and view changing. The documentation is comprehensive enough, despite a short, confusing tutorial. The program design, however, runs counter to efficient document production. On a 512K system, for example, there is not enough memory to print a document; you must exit City Desk and run a separate print utility, which does not make for a smooth work cycle. Do not expect to do any useful work with its bare-bones graphics editor, either. If you need the printer support and can live with the clunky feel of the program, City Desk may be worth investigating.

PageSetter

With a longer heritage than its peers, one would expect PageSetter to be a serious effort. The program is certainly loaded with features, and the full-featured text and graphics editors are standouts. Controlling views and page movement is eccentric but not unmaneagable and is aided by the on-screen rulers. Although the screen refreshes every time you move the page, this is balanced by PageSetter's avoidance of disk accesses. While the basic version supports only matrix printers, the availablility of additional fonts and laser printer support make this a truly useful program. The best of the bunch? I'd say so.

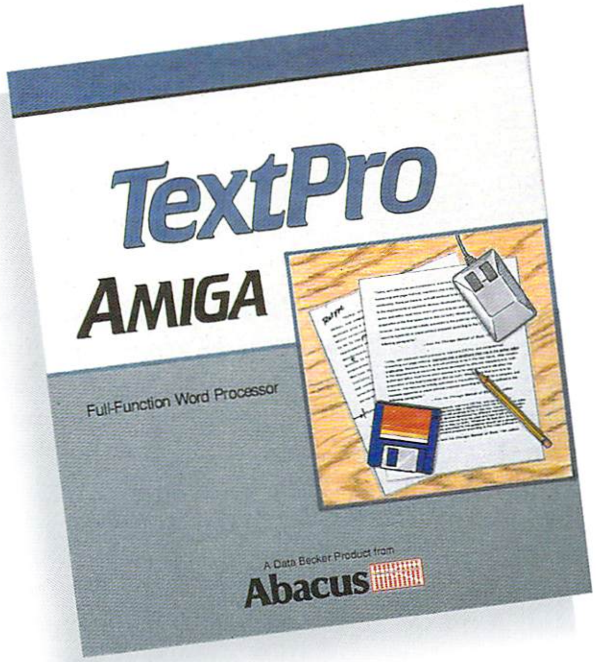
THE BAD NEWS

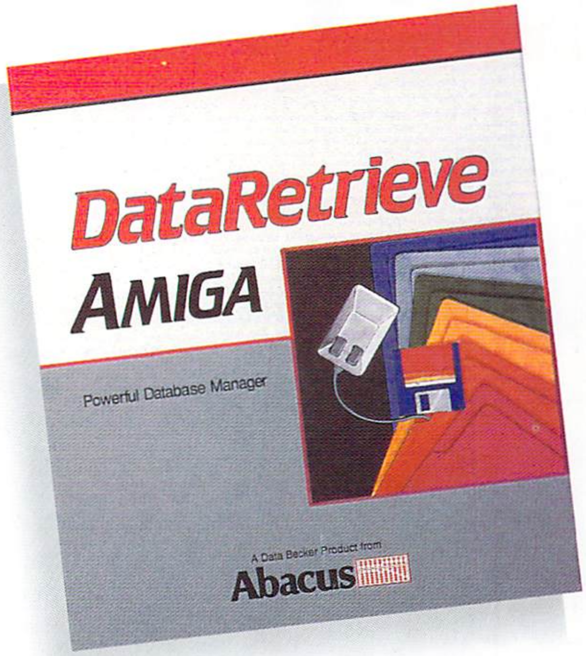
None of these programs is a real stinker, but none of them represents serious competition for similar products in the MS-DOS and Macintosh environments. All lack such important features as hyphenation, master pages, an undo command, full PostScript support, etc. Until updates or next-generation products appear, however, they represent the state of the art in Amiga desktop publishing. ■

Chris Dickman is the Director of Desktop Documentation Services, a Toronto firm providing writing, editing and design services using desktop publishing technology. Write to him c/o AmigaWorld *editorial, 80 Elm St., Peterborough, NH 03458.*

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DEPTH-DEFYING GRAPHICS

3-D PROGRAMS FOR THE AMIGA

By Sheldon Leemon

ONLY A YEAR ago, the possibility of creating three-dimensional graphics and animation with commercial software packages on small, inexpensive microcomputers would have seemed remote at the very least. About that time, however, two Amiga developers working independently of each other produced startlingly realistic 3-D graphics programs that tapped the powerful potential of the Amiga's graphics capabilities. Both of these individually conceived programs have now been picked up by commercial software companies and are available to the general user at fairly modest prices.

Part of the now famous "juggler" program of Eric Graham is the basis for a package marketed under the name Sculpt 3D by Byte by Byte. At this stage the commercial version is only an object-creation and drawing program, not a full-fledged animation package (although Byte by Byte was to have brought to market another Graham creation, Sculpt Animate 3D, by the end of 1987 to provide the necessary animation facilities for Sculpt). Meanwhile, the short animation sequences in realistic 3-D unveiled by Allen Hastings in late 1986 have evolved into the program VideoScape 3D now marketed by Aegis Development. It provides facilities for both the creation and animation of three-dimensional objects.

Although not strictly comparable because of the animation dimension missing in Sculpt 3D, both of these programs are revolutionary in what they are likely to set off in the future development of graphics on the Amiga. Our examination of the programs does make comparisons between them where relevant, but also accentuates the individually distinct characteristics of each.

VideoScape 3D

In November of 1986, at the awards banquet of the Second Amiga Developer's Conference, an Amiga user named Allen Hastings presented a pair of remarkable short films. Each frame of both had been created on the Amiga and then filmed individually with a 16mm movie camera. The realistic 3-D animation electrified the crowd, whose members had clearly never seen this kind of work done on such a small computer system. Aegis Development prevailed upon Mr. Hastings to share his movie-making techniques, and the result is a powerful 3-D animation package called VideoScape 3D.

The main focus of VideoScape 3D is the creation and playback of frames of video animation. These animated scenes may be played back in short segments at speeds of up to 30 frames per second and taped with a video recorder. They may also be taped a frame at a time, using more sophisticated and costly video gear or 16mm movie equipment. Although you may be inspired to make short films, as Mr. Hastings did, it is more likely that you will want to use VideoScape to create animated logos or title sequences for videotapes.

In order to create an animated scene with VideoScape 3D, you must first create the files that describe the shape of each object in the scene and the files that describe the motion of

each object. Then, you must create a file that describes the position and motion of the "camera" used to view the scene. Let's take a look at each of these preliminary steps.

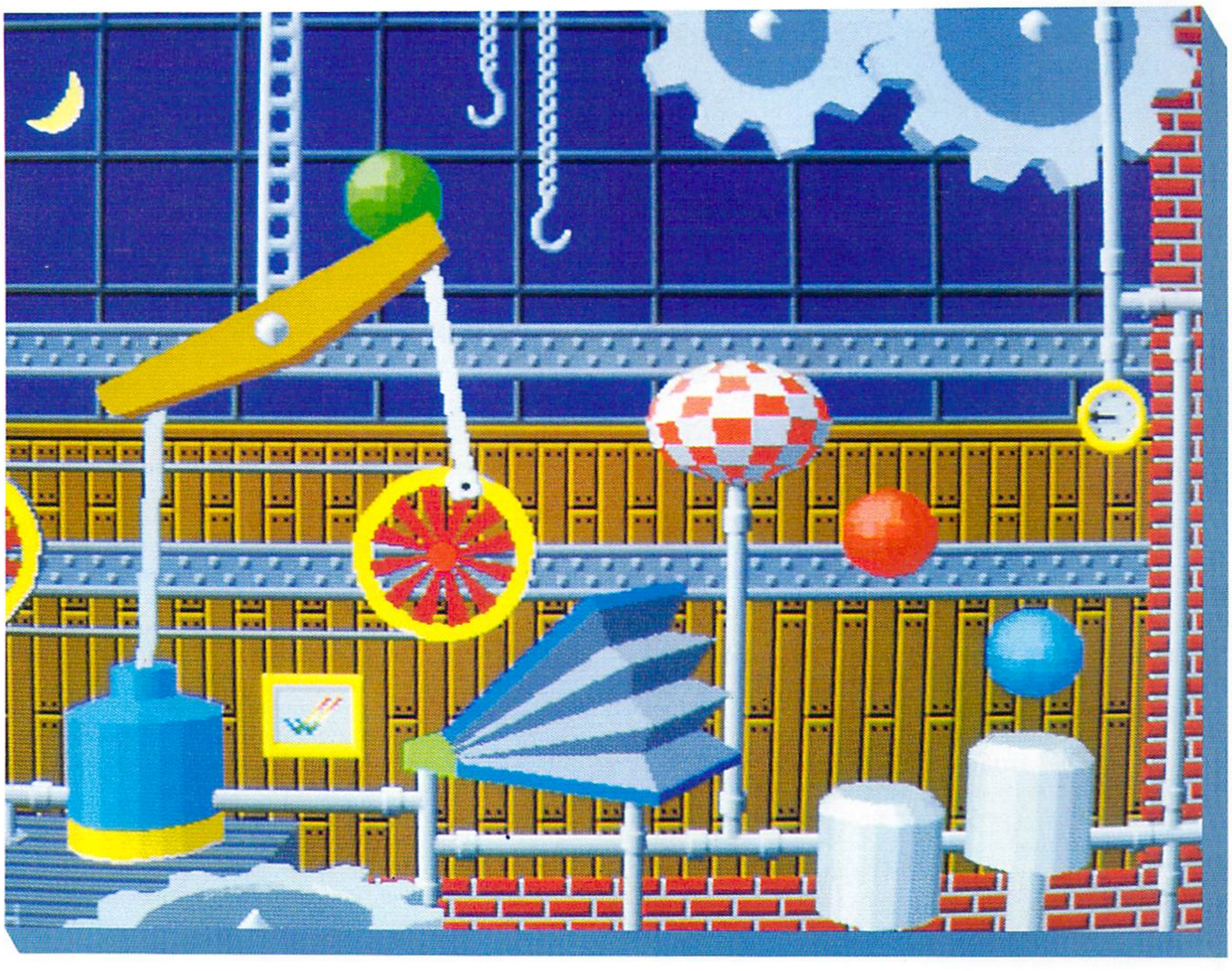
Getting Into Shape(s): Object Geometry Files

The files describing the shape of the 3-D objects are called Object Geometry files. VideoScape provides several methods for creating these files, but none are particularly easy to use or powerful. The first is called the Easy Geometry Generator program (EGG), which can be used to create regular objects, such as a box, faceted sphere, cone or cylinder. You can also use it to create very specialized shapes, such as a star field, a flat tiled surface or a ring of distant mountains. Unlike most Amiga programs, EGG is not at all interactive. When you run the program, it asks you a series of questions about the objects, which you must answer in sequence. It does not show you a picture of the object, nor does it give you a second chance to change your mind after you have answered. When you are finished, you can save the object file and end the program, or abort, but you cannot create another object without running the program again. In order to use this program successfully, you must plan your answers in advance and type them in carefully.

Another object-creation utility is the Object Composition Tool (OCT), which allows you to load one or more objects and then edit and/or combine them. You can use it to change an object's size, position, orientation or color. All objects loaded and edited in the same session are saved as a single object file. The user interface for the OCT program is exactly the same as that of EGG.

The third of these utility programs is Designer 3D. This is actually a special version of the shareware program ROT by Colin French. This program provides a much more interactive object creation environment, because it allows you to enter point coordinates and see the resulting polygons displayed in a three-window view. Its editor is quite simple, however, and limited to 98 points in 98 polygons. It makes no provision for building "standard" shapes, such as cubes, pyramids and spheres, and provides no fancy editing tools. Although it allows you to save a shape in ROT or VideoScape format, it only loads ROT shapes.

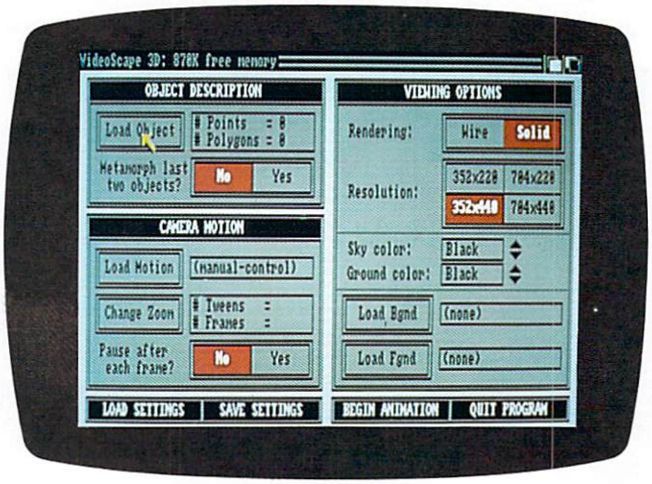
Because all of the files used by VideoScape are plain ASCII text files, you may also create an object geometry file with a text editor. Using this method entails multiple hardships. First, you must figure out every coordinate of every point, a task requiring a thorough knowledge of the mathematics of solid geometry. Next, you must enter each of these coordinates into a text file, along with the color code for each ►



polygon they create. To complicate matters further, the points must be listed in the correct order (clockwise from their visible side), and it is up to you to make sure that all polygons listed lie in the same plane.

As tedious as all this sounds, it appears that in order to make complex objects, you have to resort to this method at least some of the time. For example, although the OCT program can be used to combine two objects, VideoScape cannot draw intersecting objects. The only way to create such objects, therefore, is to manually edit the object text file so as to break the intersecting objects down into sub-objects. To assist in this task, the manual suggests first plotting out all objects on graph paper. Such a suggestion seems fairly suspect in itself. Isn't the whole point of having powerful personal computers like the Amiga to do away with crude tools like graph paper?

The next task is to define the movement of each object and of the camera that is used as the viewpoint for the scene. There are actually two types of movement to describe: positional movement, the physical movement of the object from one point to another in 3D space, and rotational motion, in which the object twists around while staying in the same



VideoScape 3D—main screen

spot. The manual explains this in aviation terms, although it uses such terminology incorrectly. In the manual, *Pitch* refers to rotation around the X axis (correct), while *Heading* is used to describe rotation around the Y axis (the correct term would have been "Yaw"). *Bank* refers to rotation around the Z axis ("Roll" would have been the correct choice). In any event, once you accept VideoScape's choice of terms, you can proceed without further confusion. Rotational movement is relative to a described "reference point," usually the center of the object, about which it rotates.

In a VideoScape motion file, you describe the object's position in the starting and ending frames, called the "key frames." You specify also the number of intermediate frames, called "tweens." The program then plots automatically the intermediate positions to provide smooth animation. The camera movement file format is identical to that of the object movement file. You place the camera at a starting and ending position, and VideoScape "moves" the camera smoothly. Note, however, you are responsible for making sure that the camera stays pointed at the scene. You cannot just ask the camera to "track" a particular object. Object motion and camera motion files must be created with a text editor. It is possible, however, to move manually the objects and camera using the Command Window.

Control Central: VideoScape's Command Window

The command window is the main part of the program, by which you put together all of the elements described above to form your animation. Its controls are divided into four panels. The Object Description panel allows you to load object geometry files and object motion files. It also allows you to enter manually the motion information for an object, as well as a position offset, so that you can have two copies of the same object in the scene at once. Finally, this panel lets you "metamorph" the last two objects loaded, so that during the scene, the second to last object loaded seems to change shape into the most recently loaded object.

The second panel is called Camera Motion, and it is used to load camera motion files. You may also choose to control the camera manually using the numeric keypad during display of the animation. Initial and final camera zoom factors may be entered, so that the camera zooms smoothly in or out during the animation.

The third panel provides Viewing Options. Full overscan is used to make the picture occupy the entire viewing area of the screen. Four resolutions are available, ranging from 352 × 220 to 704 × 440. The objects in a scene can be drawn either as wire-frame models or as solid polygons with hidden line removal. A fixed palette of 32 colors is used for 352-across pictures, while 16 colors are used for pictures with higher horizontal resolution. The objects themselves may be created only in one of 16 selectable colors (actually only 12 are currently used). Doing some color blending does allow you to simulate additional colors. These are used for shading to provide textures, such as matte or glossy finishes. Only one distant light source is used, the direction of which may be controlled, and the diffuse lighting casts no shadows. The Viewing panel also lets you load IFF foreground and background pictures; both are loaded every frame, the former before object rendering and the latter after object rendering.

The Screen panel allows you to load and save all of the settings for a scene, including object geometry, object motion, camera motion and viewing option. It also allows you to begin the animation. This is displayed on a separate screen, either a frame at a time or continuously. Because objects are constructed from solid polygons, without much shading, each frame takes only a few seconds at most to draw. Once a frame is drawn, you can save it to an IFF picture file with a single key stroke.

The program includes support for single-frame video recorders, allowing them to record each frame unattended. Although prices for such equipment are expected to come down dramatically, it is still quite expensive. A much more affordable way to record the scene is to save it first as an Anim file. This is an IFF animation file containing the initial scene, plus information about the changes between frames. It can be used with the player program included in the package to display short scenes at full animation speed. Although Aegis has been trying to make Anim a standard ►

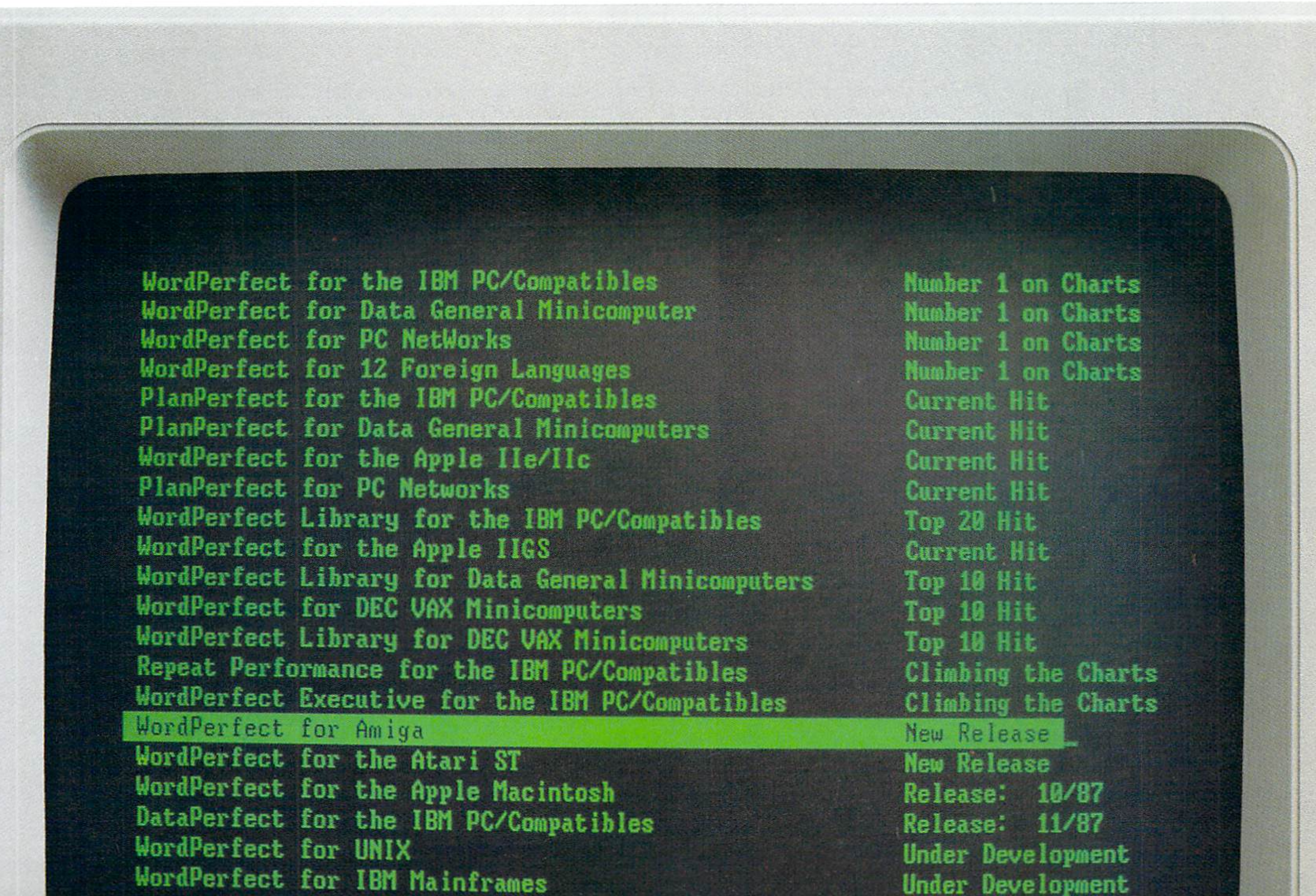
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format for displaying compressed scenes of animation, it does not appear to be robust enough to meet everyone's needs, and it is thus unlikely to be adopted universally in its present form.

After Long Deliberation . . .

Many superb animations have been created already with VideoScape 3D, demonstrating clearly the power of this software. Nonetheless, as the package label indicates, this program is intended for the video professional or advanced hobbyist, not the casual user. The object editing facilities, or lack thereof, are a real weak point. Using a text editor to create object and motion script files requires a firm grasp of solid geometry and a lot of patience. Most users will quickly discover that entering lists of numbers is not their cup of tea. Fortunately, some alternative object editors are available already, and more should appear in the near future. VideoScape users who envy the object creation facilities of Sculpt 3D should be aware that a conversion utility available from Syndesis (20 West Street, Wilmington, MA 01887, 617/657-5585) allows you to convert objects from Sculpt 3D to VideoScape format. Syndesis also plans to produce software allowing conversions from other 3-D object file formats, which should make huge libraries of objects available to VideoScape users.

Even after your objects are created, you should be prepared to invest a lot of time in order to produce a few seconds of animation. Some extra memory and a hard disk would help, too. Although the program runs on a 512K machine, it cannot record an Anim file without at least a megabyte; because a few seconds of fairly complex animation can produce an Anim file much larger than the 880K that can fit on a floppy, you will need a hard disk to cut down on the number of Anim scenes required for your animation.

VideoScape 3D has its limitations. In order to draw the objects as quickly as possible (a must when generating many frames of animation), it restricts severely the color palette selection, and it does not use the 4,096-color HAM mode. Also, it does not allow for shading of curved surfaces to make them appear more rounded. As a result the images it produces tend to be a bit flat and lifeless. Nonetheless, despite these limitations, it presents the user who is willing to make the investment of time and effort with the first workable system for creating 3-D animation on the Amiga.

Sculpt 3D

In late 1986, an astonishing 3-D animation program began to circulate. In it, a ray-traced robot juggler stood on a checkerboard landscape, juggling three mirrored balls. The moving shadows and reflections and the subtle shading gave the scene an air of intense realism. The juggler quickly became a symbol of the Amiga's graphics capabilities. The program's author, Eric Graham, said that the Amiga had allowed him to create the 3-D graphics program that he had been wanting to write for 20 years. That program—under the name Sculpt 3D—is now available commercially from Byte by Byte.

Sculpt 3D is a sophisticated object creation and drawing system. It can be used to make models of three-dimensional objects, which can then be viewed from any angle. It's useful for graphic arts and for designing imaginary "prototypes" of new products. The Sculpt program does not provide animation facilities, although it can be used to create animated scenes using a set of programs that Byte by Byte has released to the public domain. These programs provide the means to compress a number of frames and play them back as a smooth animation. Byte by Byte had scheduled for release in late 1987 a separate animation package called Sculpt Animate 3D. The current Sculpt 3D program would then be used as the object creation facility for that program.

Simplified Editing: Seeing Triple

Editing 3-D objects plays a major role in the creation of 3-D graphics, so Sculpt places a great emphasis on simplifying this process whenever possible. The main program screen contains three windows known as the tri-view. One of these windows displays the current objects in the scene from the north or south view, a second from top or bottom, and the third from east or west. Objects in the tri-view windows are portrayed in wire-frame representation, which means that they are shown as a collection of points connected by lines. Each of the tri-view windows has the normal Amiga drag bar, sizing box and front/back gadgets. In addition, each contains a number of custom gadgets that control the display. Four move arrows can be used to scroll the objects in any direction within the window. A center gadget centers the current cursor position within the window. Zoom in and zoom out gadgets change the size of objects within the window. Shift keys can be used to vary the magnitude of zoom and movement.

The program offers a wide variety of ways in which new vertices and surfaces may be entered. The most direct method for entering a point is to draw it in with the mouse. Once three points have been entered, a special gadget may be used to connect selected points as a triangular face. In Sculpt 3D each object is composed entirely of triangular faces, because, by definition, any three points always lie in the same plane. When you require greater precision than freehand placement of points allows, Sculpt enables you to open a coordinate window that shows the exact cursor position at any given point. This window also includes a tape measure tool, which allows you to measure the distance between any two points. Because it takes many points to define a curved shape, ►

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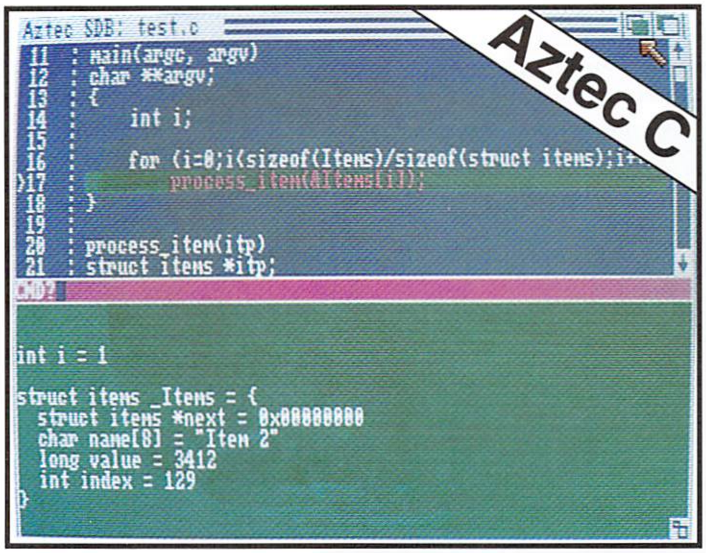
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Sculpt provides a curve tool that lets you create a number of connected points. If you use the curve tool to form a closed loop, you may use the Fill command to divide automatically the interior of the loop into triangular segments.

Entering shapes point by point can be a tedious operation, so Sculpt provides a number of built-in primitive shapes that can be added to any scene. These include spheres, hemispheres, cubes, prisms, cylinders, tubes and cones. The program also allows you to duplicate any object that already exists in the scene, so that you can, for example, turn a single tree into a forest. A variation of the Duplicate command allows you to "reflect" the object, creating its mirror image.

Because each of the built-in objects is actually composed of many triangular faces, objects such as spheres and cones are only approximations of rounded shapes. Spheres, for example, are really pseudo-spheres made up of polygons, as



in a geodesic dome. When you add one of these objects, the program prompts you to enter the number of faces for the object, allowing you to make it look rounder or more angular, as you desire.

If you want the object to look more rounded, Sculpt has some powerful features to help achieve this goal. First, it allows you to subdivide each face and to then apply the Be Sphere command, which adjusts each vertex on the face of the object so that all are equidistant from the center. The result is a pretty good approximation of a sphere. Secondly, it allows you to apply to the object an attribute called smoothing, by which you can shade the object in such a way that the curved face, although angular in shape, appears to be smooth. This feature distinguishes Sculpt from other 3-D programs such as VideoScape, which cannot produce a smooth-looking sphere.

Editing Features: Some Real "Grabbers"

Once you have added an object to your scene, Sculpt lets you edit it in a number of ways. Most of these editing operations are designed to work on the objects defined by a set of selected vertices. Points can be selected with a mouse, by using window gadgets, or with menu items. The simplest form of editing allows you to erase all of the selected points or edges, or those closest to the cursor. Another simple, but effective, editing feature allows you to make the object larger or smaller in any or all dimensions. You can also rotate the object in any dimension, choosing your own axis of rotation with the cursor.

The powerful grabber tool can move any selected points in an object with the mouse. If all of the points of an object are selected, the grabber simply moves the entire object around in the scene. Unlike such programs as VideoScape 3D, Sculpt allows you to move objects together so that they intersect. If only part of the object is selected, however, the grabber pulls only those points and thus stretches the object into a new shape.

A more subtle version of this tool is the magnet. While the grabber moves all points the same distance, the magnet has a stronger "pull" on points that are closer to it. The strength of the magnetic attraction may be varied, and the magnet may be used to either attract or repel vertices. Another sophisticated editing feature is called unslice. If you have two or more selected planes stacked over one another, this feature treats them like "slices" from a three-dimensional solid and connects them to form that solid.

Among other editing features offered by Sculpt are a couple of "power tools" that can be used to turn two-dimensional outlines into three-dimensional objects. The spin tool, for example, sweeps the selected plane around an axis of symmetry in a specified number of steps. By spinning a circle around an axis, for instance, you come up with a torus (a donut-shaped object). Instead of spinning the cross-section around, the extrude simply pulls it straight out into a third dimension. The technique is similar to forcing molding clay through a stencil. One common use for such a tool is building 3-D letters. You simply draw the letter and then pull it outward to give it the dimension of depth.

The objects that you create with Sculpt 3D have inherent display characteristics. These include the color of each face and its texture. Faces inherit the face color in effect at the time of their creation. This color may be changed at any time, using a bank of sliders, or by using the fetch gadget, which takes the average color of selected faces. The user may also change the color of a face at any time after its creation.

The texture attribute of an object face is handled in a manner similar to that of its color. When an object face is created, it also takes on the current texture. Possible textures include dull, shiny, mirror, luminous and glass. Dull surfaces reflect light in all directions, like flat paint, while shiny surfaces reflect a small amount of the light back towards their points of origin. A mirrored surface reflects light like a colored mirror, while a luminous surface emits light of a given color, rather than reflecting it. A glass surface reflects part of the light and transmits the rest. The user may modify the texture of a selected face at any point.

Drawing: Many Ways to Make the Scene

The balance of Sculpt's controls have to do with the way in which the scene is drawn. In order to draw the scene, the user must set the "observer" and the "target." The observer ►

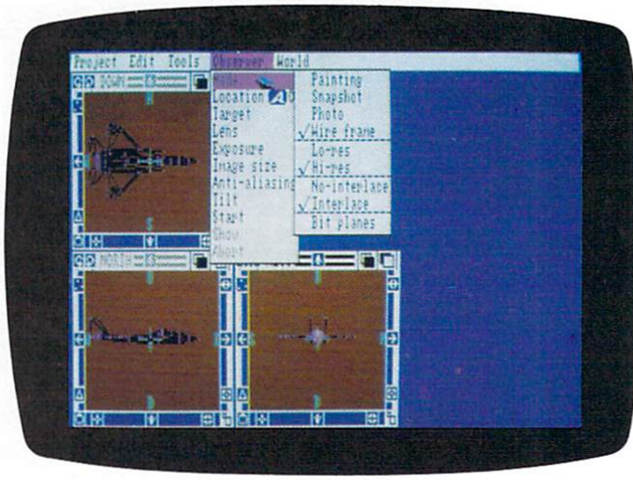
marks the position and angle from which the scene is viewed (the camera), and the target marks the position being observed. The width of view of the observer may be varied using a variety of lens settings. In order for the observer to "see" anything, a lighting source(s) must be added. These include one or more lamps, the position and intensity of which the user may vary as desired. Numerous lighting sources may be used, although each additional one increases the time required to draw the picture. The user may also select the brightness of the background (ambient) lighting. Light exposure is normally automatic, but may be controlled manually. As pictures often require the depiction of the sky or ground, Sculpt can generate automatically such a background.

The user may specify that the program draw a scene in low-resolution, high-resolution, interlaced or non-interlaced modes. The program can display a scene using anywhere from two bit planes of color (four colors) to six bit planes (the 4,096-color HAM mode). The HAM mode allows the most lifelike lighting effects, but takes the longest to draw. Sculpt can also create an image with more than six bit planes that can be written to a file for use with a hardware frame buffer device capable of a higher resolution than the normal Amiga screen.

Sculpt features a number of different drawing modes, which vary in the amount of detail produced and the amount of time taken to complete the drawing. The simplest mode is wire-frame drawing, which takes only a few seconds to complete. The next level up is called painting mode, in which the objects are displayed as colored polygons, with color and shading determined by the light sources. Color does not vary, however, within a single triangular face. This simple type of rendering is roughly comparable to the method used in VideoScape 3D.

The final two modes use a technique called ray-tracing, which computes the color of each pixel on the screen on the basis of the reflection of light rays. The simpler ray-tracing mode, snapshot, varies color and shading across flat surfaces, but does not take into account the effect of shadows. The more complex photo mode portrays shadows realistically. Both ray-tracing modes require a long time to draw an entire picture—up to several hours for a complex set of objects. For this reason, Sculpt allows you to set the size of the image in five increments, from tiny (⅛ screen size) to jumbo (overscan mode).

Because it may take up to several hours to draw a complex scene in the most detailed drawing mode, Sculpt provides a special batch mode that allows the user to designate a number of scenes to be drawn, one after another. Each image is saved to a file on disk as it is completed. In addition to reading files saved in its own internal format, Sculpt will also read



Sculpt 3D—main screen

text files that use its script language. This language allows the user to access virtually every feature of Sculpt from a text file, which allows for precise control and debugging of a scene. Although the program can read these script files, it cannot, however, save an existing scene as a text file.

With All Precincts Reporting . . .

Overall, Sculpt's object-editing facilities are outstanding. Although somewhat complex, the editing tools provided are quite powerful. After you have used them for a while, you will find yourself becoming adept at creating even complex objects. Sculpt's drawing capabilities are also quite good. The ray-tracing modes produce extremely realistic results, even though they exact their toll in the time required to draw scenes. Complex scenes, particularly those with mirrored or glass surfaces, take hours to draw using the ray-tracing modes. An updated version of Sculpt (release 1.1) is available, however, that cuts the time it takes to ray-trace a scene by up to 65 percent. Registered owners of the 1.0 version can receive this update from Byte by Byte for the cost of postage and handling. Be aware, however, that even with this time-saving improvement, ray-tracing is a slow process. It also takes a fair amount of memory. Although it is possible to use the program with only 512K of memory, at least a megabyte is required for some of the more complex objects. Despite these limitations, however, the realism of the scenes that you can create, and the ease (if not the speed) with which you can create them, make Sculpt 3D well worth considering. ■

Sheldon Leemon is the author of Inside Amiga Graphics *and other books, and he is a frequent contributor to many computer publications. Write to him c/o* AmigaWorld, *Editorial Dept., 80 Elm St., Peterborough, NH 03458.*

Product Information

Sculpt 3D (rel. 1.1)
Byte by Byte
Arboretum Plaza II
9442 Capital of Texas Hwy. N.
Suite 150
Austin, TX 78759
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VideoScape 3D
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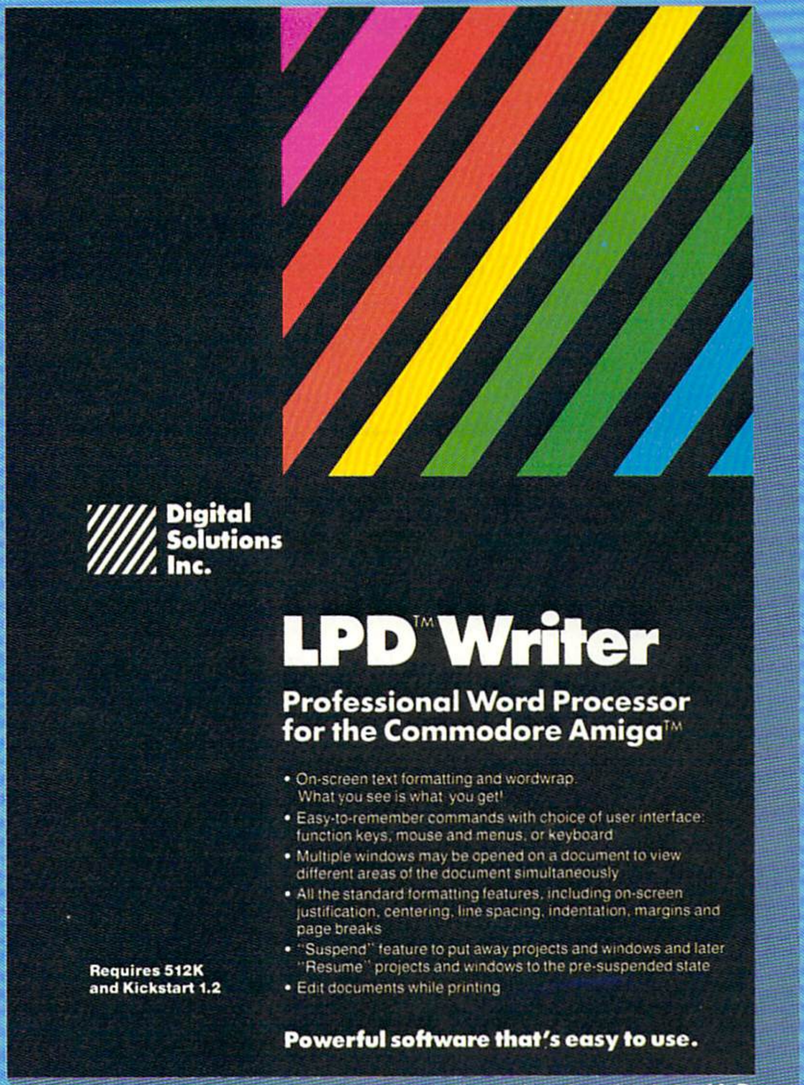
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PROGRAMMERS' CHOICE

There's buried treasure down there in the source code of many public domain offerings.

By Rob Peck

SOURCE CODE IS the English-like instructions a programmer writes to tell the computer what to do—i.e., the program before it has been interpreted, assembled or compiled into the object code (machine language) that is understandable to the computer. You can think of source code as what lies beneath the surface, so to speak, of a program. And there, down in the depths, you may be surprised to find some interesting buried treasure.

These subterranean riches are even more interesting when we look at public domain software with its *free* source code. Think of all the collections of good programs already out there: Since Fish 1 kicked off the Amiga public domain movement in December 1985, we have had Amicus, FAUG and numerous others. We also have bulletin board systems that offer a wide variety of programs, some of which still distribute their source code.

The source programs have been a great way to learn how to use some of the system routines. Often a well-organized example can serve to make the descriptions in a developer's manual make a lot more sense. You can then take a piece here, a piece there, and make something new, without putting in all the work re- ►

ILLUSTRATED BY KRIS STEVENSON



quired if you had to invent everything on your own.

However, once you have learned from one or two of a particular kind of program, it is easy to gloss over tools that might be buried within the source code of what you might consider otherwise to be a pretty standard application. I wrote this article to point out a few of the tools I found and to encourage you to browse your own public domain sources a few times just to see what surprises or inspirations might lie therein.

I will concentrate primarily on the FISH collection of public domain disks, because this group is nearly complete (as of this writing there are 90 disks available). I tend to be a collector of languages and tools, as well as being a tool builder (for example, the AudioTools from the July/Aug. issue of *AmigaWorld*, p. 18). Thus, I like to keep my eyes open for things that would make my own job easier.

What You See is What You'll Get

A prime example of this discovery-by-browsing happened about 18 months ago, when I encountered a program called **PDTerm** by Michael McInerny on FISH 14. By the time this disk became available, there were already several terminal programs available for the Amiga, both commercial and public domain. Nearly all of them had more capabilities than PDTerm. I obtained disk 14 at the same time as I received a batch of other disks with terminal programs. That made it highly unlikely that I would notice anything unusual about it. Bring up the program . . . try it . . . works fine . . . standard menus . . . okay, go on to something else. Well, just for the heck of it, I listed the source code. Here's what I found in the main program (*terminal.c*):

```
struct Menu *MenuHead;

InitMenus()
{
 struct Menu *CurrentMenu, *NewMenu(), *AddMenu();
 struct MenuItem *CurrentItem, *SubItem,
                 *AddNewMenuItem(), *AddItem(),
                 *AddNewSubItem();

   CurrentMenu     = NewMenu("Project", 60, 10);
   MenuHead        = CurrentMenu;
      CurrentItem = AddNewMenuItem
             (CurrentMenu, "About PDTerm",100,11);
      CurrentItem = AddItem
             (CurrentItem, "Window");
         SubItem   = AddNewSubItem
             (CurrentItem, "to Back",68,11);
         SubItem   = AddItem(SubItem,  "to Front");
      CurrentItem = AddItem
             (CurrentItem, "Quit");

   /* (more menu initialization) */

   SetMenuStrip( TerminalWindow, MenuHead);
}
```

Aha, menus made easier! Michael McInerny provided a nice set of functions that build simple menus. These functions allocate memory the size of the Menu and MenuItem data structures, initialize them his way (color, kind of text, shape and so forth), then return a pointer to the end of the current list of items or subitems. This allows other similar functions to be used to link things together into a complete menu that he can link to his window. Corresponding fuctions are provided to return the memory to the system when the program is finished.

Imagine being able to *look* at the source code and *see* the menus as they will appear on screen. This certainly will make it much easier to debug a program.

The dynamic menu creation functions are all contained in *menus.c* and include the following:

NewMenu, AddMenu—takes care of the title bar

NewMenuItem, AddNewMenuItem—first-level menus

AddNewSubItem—second-level menus

DisposeItem, DisposeItems—free the memory used by the the preceding two functions

DisposeMenu, DisposeMenus—free menu memory used

NewIText, AddIText, DisposeIText—internal functions for IntuiText within menu items and subitems

This group of functions was a real find, especially considering that there was no commercially available product at that time.

In addition to the *menus.c* file, PDTerm also includes a file called *console.c* that contains a few functions that make it easier to get to the console device. These routines are actually extracted from a program called *cons.c*, written by Bob Burns of Amiga and myself, that appears on FISH 5. In *cons.c*, we provided a set of console device tools, along with a set of macros that give names to functions you would want the console to perform. These include:

CURSUP(c), CURSDOWN(c), CURSFWD(c), CURSBACK(c), Tab(c), Backspace(c) and so forth where "c" is a pointer to a message data structure that was initialized to talk to an opened console device managing a particular window.

OpenConsole, CloseConsole, ConPutChar, ConPutStr, QueueRead, ConGetChar and ConMayGetChar which actually handle the console communications and the basic functions on which the above console macros are built.

If you need to use the console device, this group of functions gives you a head start.

Pop Goes the Menu

Another menu item of unique interest appears on FISH 57. **Splines**, a drawing program created by Helene (Lee) Taran, contains a complete package that allows you to create pop-up menus on the Amiga. The normal Amiga menu style is the pull-down menu, where you go to the top of the screen, turn on the menus and pull them down to make your selections. On some occasions, however, pop-up menus can be more convenient; wherever your mouse pointer is right now, that is where a menu can be made to appear.

In Splines the pop-up menu is used to provide context-sensitive selections—that is, a different kind of

menu depending on exactly where on screen your mouse cursor happens to be. Although Splines is a drawing program and may not be of particular interest or use to everyone, the program chunk containing pop-up menu creation could be very useful in a wide variety of other programs.

Despite the fact that Splines is a relatively small package, it also uses some other functions that are interesting and unique. For instance, a function called LockLayers prevents a program from trying to modify the display while the pop-up is in place, while SwapBitsRastPortClipRect (what a mouthful!) allows you to create an entire display off screen, then simultaneously put your rectangle on screen while saving what is currently on the screen in the area you used for doing the original drawing. Although the program might freshly draw the menu each time that pop-up is called, you do not see any of the intermediate steps. Helene Taran made a good choice of functions to use for this.

Keep Those Request(er)s Coming . . .

In the area of requester routines, I found three public domain items of interest. First, on a very basic level, there is a tutorial from John Draper on FISH 1 under a directory named Requesters. The tutorial provides a good starting point and helpful hints and techniques for creating both requesters and gadgets.

FISH disk 34 contains a file requester from Kevin Clague modeled after the requester that DeluxePaint uses to obtain the names of files and directories. This program uses a true requester, meaning that the requester stays where it was when it was opened and waits for you to complete your selection before it disappears.

A source code edition of another, but less orthodox, file name requester is found on FISH 41 under a directory named GetFile. Written by Charlie Heath, the program provides the expected function of allowing you to retrieve the name of a file and the name of a directory. An interesting wrinkle in this program, however, is that this so-called requester is actually a full Intuition window. Using a window instead of a requester allows you to employ the mouse to drag the file name requester around on screen while deciding how to respond. Thus, if the requester covers up something on which you are presently working that might have a bearing on which file you might wish to select, the requester can be moved to allow viewing of what is underneath it. Charlie Heath generously grants his permission to use the requester, as object code, in any commercial or non-commercial program.

The items I've noted above are only a few of the useful tool packages that are a part of the public domain for the Amiga.

This article has only just scratched the surface. I am sure that many of you have discovered other such tools on your own.

So many people have contributed their time and efforts to these programs that I wish I could mention all of their names and thank them all for the tools we now have. Thanks to the CATS (Commodore Amiga Technical Support) staff who have provided quite a few good tools and demo materials and who tell us the "correct way" to program certain things for the Amiga. And thanks, too, to all of the folks who create these PD collections for us to enjoy.

If you find something you like, tell the authors. If it is shareware, register it with the authors. You will help them pay for the time they spent in developing the product you liked and encourage the creation of even better tools. Who knows, you may receive the latest and greatest version of the program when you register, or additional documentation, or catch the author's ear for suggested improvements. They will be happy to hear from you.

Go ahead, browse through your disks again—there just might be some buried treasures waiting for you.

Rob Peck is the author of Programmer's Guide to the Amiga *and was manager of technical documentation for Amiga. You can contact him at: DATAPATH, PO Box 1828, Los Gatos, CA 95031.*

USERS' CHOICE

The author of AmigaWorld*'s "The Best of Public Domain" doffs his cap to his top PD choices of 1987.*

By David T. McClellan

ALTHOUGH MANY MORE commercial software packages appeared on the Amiga market this past year, public domain offerings still managed to keep pace. My list of 1987 favorites will contain only "for-use" programs (i.e., those productive little items that help you accomplish a variety of useful tasks, or those, like games and graphics demos, that are for entertainment or enjoyment). ►

A few caveats before we begin: First, because of *AmigaWorld*'s lead time, we will probably miss a few good offerings that come on the public domain scene in the latter part of 1987. In addition, my main sources for public domain software are USENET, Fred Fish's collection, and various Amiga Bulletin Board Systems (BBSs). Therefore, software from BIX, CompuServe and some other services may not have trickled down into my sources in time for me to write about it. Finally, I also excluded shareware (pay-if-you-like-it software). No fee, only free will be our motto.

I have organized my choices into seven categories: Command Processors (CLI—Command Line Interface—replacements), Text Editors, Compilers/Assemblers, Terminal Emulators, Graphics and Sound utilities, Games and Miscellanea.

PIRACY VS. THE PUBLIC DOMAIN

ALTHOUGH I AM a very vocal proponent of public domain software, I don't condone software piracy. If somebody sells a program in the commercial marketplace, I have no right to use it without paying for it. At exactly the time I was writing this piece, a note came down USENET discussing ten or twelve pirate bulletin boards and the damage they were doing. Certain individuals break the copy protection on recently-released software, upload it and then provide the programs on these pirate bulletin boards—sometimes only a day or two after they hit the market.

To some people this may sound fine, but it's only a short-term gain. The one thing that will keep the Amiga going is a healthy market for its software. If a program is put onto a pirate BBS, the author loses several hundred sales and will not be likely to write more Amiga programs. In the IBM-PC market, many buyers might think twice about unauthorized copying after the rash of Lotus Development suits. But with the Amiga, we ourselves are the marketplace. People who steal from these authors are poisoning their own seed corn. Report pirates when you find them, and *don't use them.*□

—D.T.Mc.



Command Processors

The Berkeley C-Shell has long been my favorite command processor. As a veteran Unix programmer, I always have withdrawal symptoms when I switch over to the Amiga and have to use the AmigaDOS CLI. Fortunately, Matt Dillon (whose USENET address is a Berkeley machine) decided to write and enhance **Shell**, a C-Shell-like command processor for the Amiga, and he and Steve Drew have added quite a bit to it over the past year.

Like the Berkeley C-Shell, it supports aliasing (having the shell remember an abbreviation for a long command and its arguments), history (having the shell remember and edit/reissue commands you issued a few minutes ago), variables (named string which can be substituted into commands) and shell procedures (sequences of commands and flow-control expressions similar to but more powerful than those run by the CLI Execute command). It also has I/O redirection, search paths for commands, and a number of built-in utilities. The most recent version as of this writing is Shell 2.06m.

Text Editors

Because I work on several different systems—Unix, IBM PC, Amiga and Macintosh—I hate having to learn a new editor for each machine. I prefer an editor that I can use on as many of the above systems as possible. It also has to be fairly powerful, fast, customizable and, preferably, public domain (so that the user can port it to any new system). **MicroEmacs**, a small version of Emacs, fits all these requirements. It has many of the features found in the mainframe versions all the way back to Richard Stallman's first Emacs editor at M.I.T. (Emacs is a full-screen, customizable and programmable editor, with more features than you can shake a mouse at. Most commercial versions run on mainframes and large minis.) Several years back, Dave Conroy wrote MicroEmacs to run on much smaller machines. Daniel Lawrence picked it up and continues to provide extensive enhancements. MicroEmacs now runs on most Unix, Amiga and VAX VMS systems, as well as on all MS-DOS machines, Atari and several more-obscure systems. (Commodore-Amiga even adapted a copy to Workbench menuing and included it with the 1.2 toolkit.)

MicroEmacs is a full-screen editor with a customizable keyboard, programmable macros, windows (in its own style, not that of the Workbench), multiple file ed-

iting, simple word processing features and more. It is fast even on my antique IBM PC, and, more importantly, *it doesn't get in my face.* The most recent version I have is MicroEmacs 3.8i; I use it on my PC and Amiga, and on the Sperry Unix system at work. MicroEmacs also comes with a substantial and very useful manual.

Languages/Assemblers

Although compilers and assemblers are difficult to write, there are several public domain offerings available for the Amiga. **XLISP**, an object-oriented Lisp interpreter that runs on the Amiga, IBM PC, Unix and other systems, is my personal favorite. Version 1.7 is the most current. Also available are an assembler (**Asm** or **Asm68k**) and compilers for Modula-II and a structured, fast language called **Draco**.

Terminal Emulators

One thing I don't need more of is hardware. With two computers and a lot of books in my little office at home, I live under a constant threat that my wife will bulldoze the lot out the window. As a result, my computers do double duty as terminals. For an emulation program, I normally use **Kermit** (see July/Aug. '86 issue of *AmigaWorld* for my article on C-Kermit—a program that Jack Rouse of Cary, NC did an excellent job of porting to the Amiga). Not all BBSs, however, support the Kermit protocol; consequently, I have to use an emulator that also supports the XMODEM file-transfer protocol.

VT100, an excellent menu-driven VT100 emulator written by Dave Wecker, provides both protocols in addition to simple text capture (and does a good simulation of a VT100 as well). It handles baud rates from 300 to 9600 and wildcards for sending/getting batches of files. VT100 also runs scripts with commands for everything available via menu as well as enough other commands to support automated log-on to other systems.

Graphics and Sound Programs

It is an unfortunate fact that areas in which commercial programs are available early and in good quality often have very little public domain software. With good, inexpensive graphics and sound (music) software available, Amiga users—even those on beer-and-twinkies budgets—could afford the commercial offerings almost from the very beginning.

Almost all non-commercial graphics programs with which I am familiar fall into three categories: picture/animation players, demos and display hacks (such as the Boing demo or Eric Graham's Juggler demo), and actual artwork. The one exception I've found is a recent 3-D solid editor/animatior named ROT, written by C. French. With it, you can create simple 3-D objects with polygonal surfaces using a simple wire-frame editor, color the surfaces, and build 24-frame animations. These animations can move and rotate the objects in three dimensions.

We find the same situation holds true for sound. The available public domain items are mostly for playing, not creating, music or other audio output. Digitized

I'VE DOWNLOADED MANY GOOD PIECES OF ARTWORK FROM THE BBSs: CARTOON AND COMIC BOOK CHARACTERS, PAINTINGS AND OTHER GEMS. THERE'S GOOD MUSIC, TOO—CLASSICAL, JAZZ, FOLK, ROCK AND MOVIE SCORES.

sound players, song players and songs represent the majority of free music offerings. (If, however, I've missed a good public domain paint, draw, or make-music program, please forgive the omission and let *me* know where it is.)

Some of my favorite graphic demos are "display hacks" written by Leo Schwab. **RobotRoff** is hilarious and my favorite. Sorry, no further explanation is offered, as it might ruin the effect.

Since programs were unavailable, I've downloaded many good pieces of artwork from the BBSs: cartoon and comic book characters, paintings and other gems. There are also a good many pieces of music—classical, jazz, folk, rock and movie scores. I use **SHOW** to display pictures; it and several others are available on most BBSs (look for IFF picture displayers). I use **SOUND** to play IFF format files and **JUKEBOX** for jukebox files; most other music can only be played with the commercial package that created it.

Games

One of my favorites among public domain games is **Hack**, which John Toebes has ported to, and maintained on, the Amiga. It is a map-on-the-screen adventure game with mazes, monsters, weapons, magic and variability. There are also a number of public domain versions of board games available. Some good BBS board game offerings include **Othello, Go-Moku, chess** and **Clue**. Gaming is typically well supported in the public domain community.

Miscellanea

There are good programs that refuse to fit in any niches. **StarPlot** is my choice for inclusion in a "miscellanea" covering such programs. Written by grad student Darrin West, it is distributed on USENET along with a mass of star data (locations, brightness and so forth). If you provide the longitude (right ascension), latitude (declenation) and width of the field of view you want, all in degrees, it plots the requested area of the night sky on the Amiga's screen. The picture is excellent and the program is a lot of fun. ■

David T. McClellan is a contributing editor to AmigaWorld. *Write to him at 104 Chevron Circle, Cary, NC 27511.*

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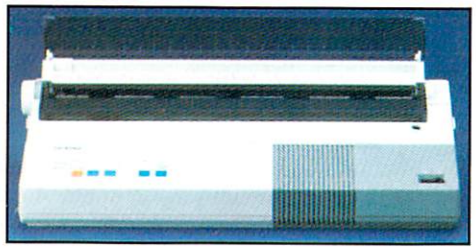
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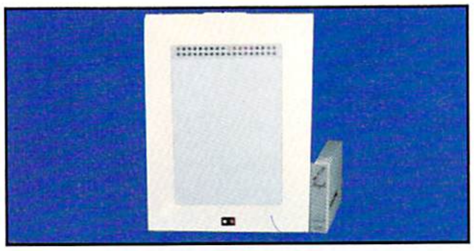
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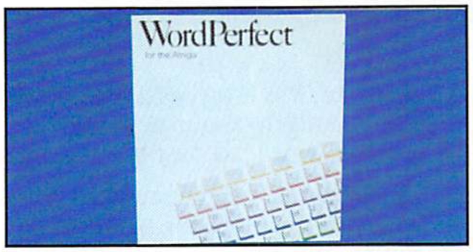


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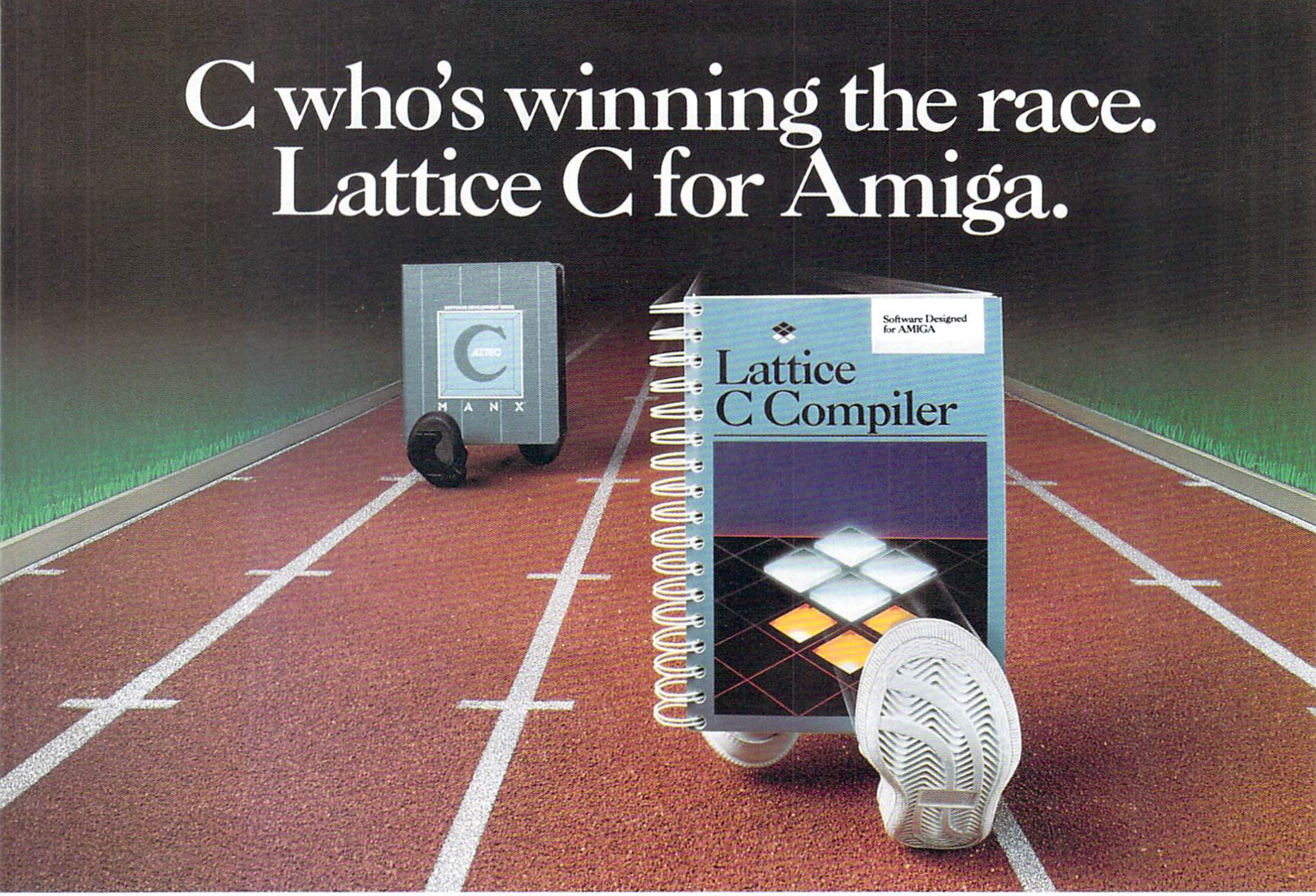
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Just Fooling Around

Our hard-hitting, "hands-on" columnists abandon their usual forays into the intricacies of C programming, compilers and the CLI to present their favorite choices among Amiga games.

By Mark L. Van Name and William B. Catchings

ONE OF THE DEMONS that has plagued the Amiga since its announcement is a vague fear of many potential users that it is little more than a game machine. To help to counter that fear, many of us have tried hard to show how much real work it can do. We have written programming tutorials, discussed hardware and software, and, in general, focused on its role as a serious computing tool for the programmer, the businessman and other professionals.

Well, folks, we're well into the holiday season, and there's still some time to kick back and enjoy! The Amiga *is* a great game machine, after all. For this column we have buried the spreadsheets (we will return to them next time) and compilers under a tall stack of wonderful diversions, from action and adventure games to sports simulations and games of strategy.

Let's make one thing clear right up front: this column is *not* a serious review of Amiga games. It is a list of six games that we enjoyed thoroughly, never found boring and recommend heartily. We made our choices with no pretense of objectivity. We did not try every game available. Even so, our toughest task was choosing which games not to discuss.

Not all of these games were originally written for the Amiga. All are, however, visually, and often audibly, excellent. You could justify buying a couple of them just to show off the power of your Amiga. Here, in alphabetical order by title, are six fun games that should provide you with many enjoyable hours.

One last thing: we feel obliged to warn you that all of these games can be addictive and may consume a large part of your life!

Defender of the Crown

This is one of the most visually stunning games we have seen. Hiding behind the pretty scenes is a simple strategy game with some rudimentary action sequences. You play a Saxon lord trying to reunite Britain under Saxon, rather than Norman, rule. Britain is divided into many territories, and to reunite it you must conquer all of them. You conquer territory by funding campaign armies and sending them out to battle. Your income is based on how much land you control. The setup of your armies and the major battles are done rather conventionally with no graphics.

The graphics come into play in other facets of the game. For example, when you are desperate for money you can raid the treasuries of other castles. You then are presented with a scene in which you and your band of men must fight past the castle guard quickly enough to grab the money and run. Jousts provide another nice set of illustrations. You can choose to joust for either territory or fame. You are shown the horse and rider racing at you, and you must hold your lance steady and hit your opponent perfectly to unseat him. Another set of images appear when you attack a castle with a catapult. You can watch as the wall crumbles under your attack.

While few of these action sequences can stand up to the state of the art in arcade games, all are a pleasure to watch. The strategy game underlying it can wear thin, but Defender of the Crown is a great way to show off the Amiga's power.

Déjà Vu

Déjà Vu traces its lineage to one of the more venerable computer games, Adventure. It surpasses its ancestors by including graphics. While not the first program to bring graphics to an exploration game, it is one of the best. Instead of describing a scene to you, it shows you a picture of the room or place in a window. Another window contains images of the things you are carrying, your "inventory." You find objects by spotting them on the screen or by "opening" other objects and examining the contents. You can drag objects into and out of your inventory.

Your character is a hard-boiled 1940s detective. You start the game with no memory of who you are. As you explore the building in which you awakened and the surrounding area, you find clues that point to you as a murderer. Because you know that you are a good guy, you must find out who you are and who is trying to frame you.

We have not completed this game, but so far we are having a blast. (We must confess to having ordered a clue book in a moment of desperation.) As is true of most games of this type, you must inspect *everything*. We were stuck once because we did not think to "open" a corpse.

This game was originally developed for the Macintosh, but the Amiga version is well done. It runs from the Workbench and returns you there when you leave it. Few Amiga games are so well behaved. If you ►

like Adventure-style exploration games, you will have a great time with Déjà Vu.

Earl Weaver Baseball

If you are a baseball fan, Earl Weaver Baseball is a must. (See the Nov. '87 issue of *AmigaWorld* for a feature-length review of Earl Weaver Baseball.) You can play it primarily for strategy or action, or both. You can control not only every pitch and batter, but also the lineup and the "plays." There is nothing quite like pulling Bob Gibson from the mound to bring in Sandy Koufax as a reliever! You will need to consider such substitutions when you see the batting order: Ty Cobb, Babe Ruth and Lou Gehrig all await you. If that's not bad enough, the opposing pitcher is Cy Young.

You can control virtually everything. You can pick all-star teams from the disk or create your own. You can even pick a ballpark or build a new one. The Green Monster in Fenway adds a certain touch of realism. You can concentrate only on managing the team, or you can control the individual players as if you were playing an arcade game, or you can control it all. You can play the bunt by having the third baseman charge. Shift the outfield to accommodate a pull hitter, especially if the wind is blowing that way.

This game is tough to master. Bill, our sports expert, still gets whumped consistently. It is full of little touches, however, that make the losses worthwhile. One time there was a close call at first base when our runner looked safe. Much to our surprise our manager came running out of the dugout to argue the call! He even kicked up a little dirt at the ump. Sometimes throws to first sail over the first baseman's head. Pitches can get away from the catcher. The more you play this game, the more you'll appreciate it.

Julius Erving and Larry Bird Go One-on-One

This game is playground one-on-one basketball at its best: Dr. J versus Larry Bird. You can use the Doc's superior speed, as he fakes first left, then right, and then drives around Bird for an easy two. You can let Bird get off a quick three-pointer barely a step in from the edge of the court. The graphics are good and the sound is wonderful, particularly in stereo. If you have needed an excuse to hook your Amiga to a receiver, wait no longer. As the players dribble from right to left, the sound follows. The fans on each side cheer for a different player.

This game was one of the first for the Amiga. It has stood up well over time. It offers plenty of options, and the computer opponent plays a good game with enough different skill levels for everyone.

Marble Madness

Marble Madness is an action game that is based on an earlier arcade version. Your job is to guide a marble through a maze within a given period of time. There are five increasingly harder mazes. Unlike normal mazes, these have ramps, sheer cliffs, rogue marbles trying to knock you off, odd creatures out to get you, and a host of other obstacles. The sound and graphics are excellent, and the game shows a great sense of humor. If your marble falls off a cliff and breaks, a little whisk broom comes and sweeps you up. Sometimes a fairy wand grants your marble extra seconds with which to complete the maze.

With two players you can have even more fun. You can race against each other in the usual way, or you can let your marbles *interact*. A gentle nudge when your opponent is negotiating a tough turn can be very satisfying. Marble Madness is also rumored to have a hidden water maze. We never found out how to reach it, but we had lots of fun trying. The game is challenging, with enough levels of difficulty to keep you coming back even after you have mastered it.

Shanghai

Some people who love board games remain leery of computer games. Shanghai is a computer game well suited to such people. The game was a hit with everyone we persuaded to try it. It is based on the ancient Chinese game of Mah-Jongg. The concept is simple: you have to clear 144 tiles from the game board by removing matching pairs of tiles. Some of the tiles are stacked and block each other so that the game stays challenging.

It is deceptively simple. Although you may lose several times in a row, you feel sure each time that you will win the next game. You also can play against other players. Once, two of our friends were playing and they managed to clear all the tiles—no minor feat. While they were talking, they noticed something happening on the empty green "felt" playing surface. The middle of it started to catch fire, à la Bonanza. A hole the size of a silver dollar "burned" in the middle of the screen and then an eye peered out and looked back and forth. They guessed that it was a dragon. While we could never reproduce this effect because our disk died unexpectedly, it remains one of the most unusual of the mysteries we encountered.■

William B. Catchings and Mark L. Van Name are contributing editors to AmigaWorld. *Write to them at 10024 Sycamore Road, Durham, NC 27703.*

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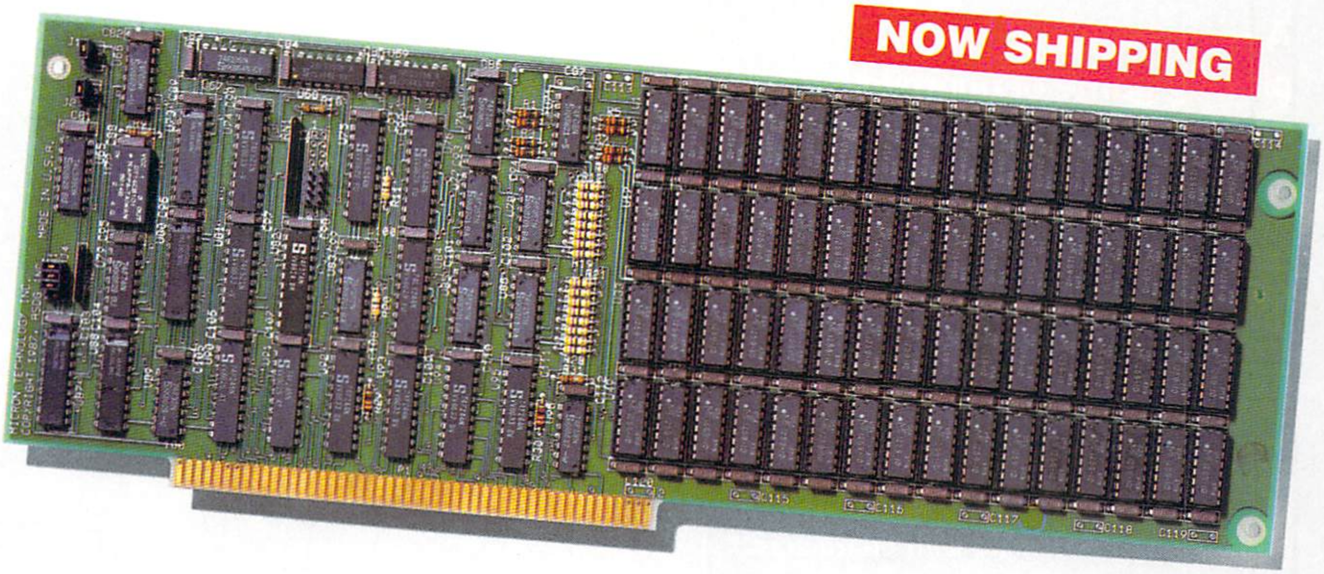
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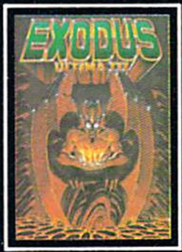
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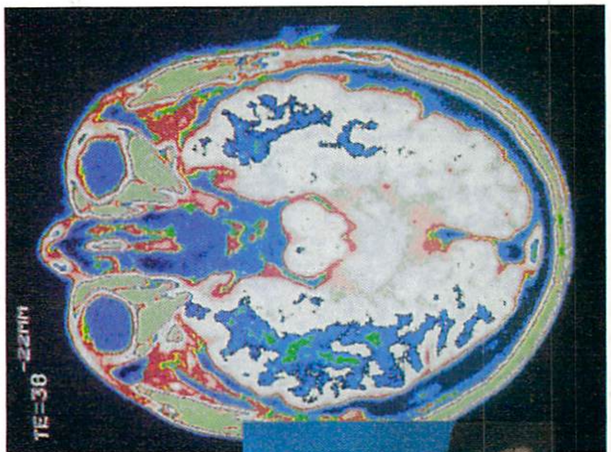
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Surgery . . . 68000-Style

Amigas are "scrubbing up" at UCLA's School of Medicine to aid in perfecting brain surgery techniques in a highly-innovative research program.

By Ben and Jean Means





Digitized image of human brain on the Amiga. Inset: Dr. Harper and his Amiga.

The brain is the most amazing device ever created. It automatically controls breathing, heart rate, digestion and cell repair, with power left over to process sight, sound, smells and other sensory information. At the same time, the brain thinks with logic or intuition and communicates ideas to others through speech. Truly, the brain is the most powerful "multitasking environment" we know.

But when our amazing biocomputer breaks down, the quality of our life—and sometimes even life itself—is threatened. In some cases where surgery seems the only answer, medical science has turned to another powerful multitasking environment, the Amiga computer.

Dr. Ron Harper, Professor of Anatomy at the UCLA School of Medicine, tested many computers before deciding to use the Amiga in his Brain Imaging Research Project, dealing with temporal lobe epilepsy. This severe form of epilepsy, associated with seizures deep in the brain, causes a variety of visceral and autonomic dysfunctions. Most tragically, if left untreated, the epilepsy tends to deteriorate into generalized seizures spread throughout the brain.

If a seizure can be pinpointed within a discrete location of the brain, then the neurosurgeon can remove the source of the seizure's focus. In the past, surgeons had to destroy valuable brain tissue just to catch a glimpse of the electrical activity deep in the brain. However, today's sophisticated imaging equipment, costing over a half million dollars, can capture this deep brain data with much less invasive techniques and then transfer the digitized color pictures onto the Amiga.

According to Dr. Harper, "These digital brain images let us know if surgery is even feasible. Over a period of time, the unaffected hemisphere may learn the seizure behavior of the affected hemisphere. Once this 'mirroring' occurs, surgery is impossible since we can't remove that much brain tissue without disrupting other body processes. The doctors use every scrap of information ►

they can get before surgery; the results have been much better than we would have thought possible before these imaging procedures."

Techniques of Computer Brain Imaging

Until just recently, all a neurosurgeon had to work with was the Computerized Axial Tomography (CAT) scan, which is best at showing bony structures, and deep implant electrodes, which were difficult to place without causing bleeding or excessive brain damage. However, new computer imaging techniques, like the DSA, MIR and PET scans, have revolutionized the field.

The introduction of Digital Subtractive Angiography (DSA) made it possible to see the blood vessels; Magnetic Imaging Resonance (MIR) shows the soft tissues of the brain; the Positron Emission Tomography (PET) scans reveal the location and intensity of brain activity through the uptake of radioactive glucose. The data captured on these expensive scanning machines can then be transferred as images to low-cost microcomputers like the Amiga so the surgeon can study them at his or her convenience. Another advantage of using a microcomputer is the ability to layer these different scans, each one showing different brain characteristics. Thus, a DSA, PET, MIR and CAT scan can all be combined into one image or can be shown side by side for more data than any one of them would yield separately.

Now before placing deep implant electrodes, the neurosurgeon can see a color picture on the Amiga of the exact shape of the brain, the location of its blood vessels and where interesting brain activity is occurring. Electrodes can then be placed with precision where they will cause minimal damage and yield maximal information.

The UCLA Brain Imaging Project sees the Amiga as its ideal choice for medical imaging, with a bright future ahead for computer imaging of all kinds. Dr. Harper says, "The traditional CAT scans are going out. You're literally running against the clock, because the patient can only take so much x-ray bombardment before you start to worry about radiation overdose. The trade-off is how much the CAT scan will show versus how much radiation the patient will receive. That's where MIR is so valuable, because the patient is only subjected to magnetic fields instead of ionizing radiation. In addition, you can now see the soft structures in picture form. Like with a tumor, you can see the displacement of the surrounding tissues and the built-up fluids.

"Before this kind of imaging became available, the margin of error was much greater. We're working with very invasive procedures. We used to have to fill the ventricles with contrast medium to see the spaces in the brain. Now with MIR, that's not necessary anymore. Early detection is so important; in the old days, our first clue came when a patient had a major dysfunction, which was often after the brain damage was already too advanced. Now with early detection, we can catch these problems earlier and use less invasive corrective surgery. Knowing when to cut is just as important as knowing when not to cut; we can just scan the area and get a picture on the Amiga of what's going on."

These pictures currently take the form of two-dimensional slices through different levels of the brain, but Dr. Zhang, a neuroscientist from mainland China, is working on Amiga software for a full three-dimensional reconstruction of the brain. A doctor will be able to take a "Fantastic Voyage" on an Amiga through a patient's brain to visualize exactly how dysfunctions are occurring and how to treat them.

Brain Imaging Computers

Currently, brain imaging for the research project is done on an expensive MicroVax computer, which Harper is in the process of replacing with the Amiga. He chose the Vax because of the specialized body of programs available; however, the Vax costs $80,000, and Dr. Harper adds, "You have to get used to other big machine costs as well, like paying $700 for the reference books or $2,500 for a word processor. You also get a level of support that is, in a word, poor."

On the particular day we visited, the Brain Imaging Project was using the MicroVax for the first time to prepare a patient for deep electrode implants. Dr. Harper said enthusiastically, "During surgery you can't show rows of numbers. You need to transform the signals into something that the surgeon can glance up at so that he can know immediately the results of what he has just done. That's best done with colors and shapes. Right now the trend is towards expensive special-purpose machines, but with the right software, the Amiga can do the same thing, but at a much lower cost."

The Amiga will eventually replace the costly MicroVax completely in the UCLA lab, and with the Amiga's low cost, every resident, graduate student and neurosurgeon at UCLA can have his or her own Amiga workstation. The Amiga is a dream come true for Harper, who adds, "There are still a couple of bargains left in the world. One is a medical school education at UCLA; the second is an Amiga. In terms of a very low-cost workstation, the Amiga really is a phenomenal bargain!"

Dr. Harper considered the Mac II, but found it was "an order of magnitude more expensive than the Amiga." He also considered the $7,000 DEC basic workstation, but as associate Dr. Frysinger noted, "With all the add-ons we need, who knows what a complete workstation would cost. That's what is so great about the Amiga; not only is the CPU cheap, but the peripherals are reasonably priced as well. You just can't beat the price of an Amiga."

The only features the Amiga lacks for optimum medical imaging are a slightly higher resolution, which is necessary for x-ray images, and an eight-bits-per-pixel display. Harper finds that the Amiga's six bits per pixel is adequate in applications like the PET scan, but thinks that eight bits per pixel would be excellent, along with a faster coprocessor.

Medical Hardware and Software for the Amiga

The new Ameristar Board, which gives NFS Ethernet networking, has opened up the Amiga as a tool for low- ►

cost medical computing. Ethernet is a crucial protocol for tapping into different medical databases and devices; it allows you to talk to a whole host of coprocessors. For example, most of the Mag Res machines with which Dr. Harper works have Ethernet connections, enabling him to simply grab the image and transfer it to the Amiga. These Magnetic Resonance Images are 512 × 512 pixels, so he will only lose a little of the bottom of the image in the transfer. And Harper finds, "The cost of the board [$700] is trivial when you consider that you can instantly transfer information from a half-million-dollar scanner into the Amiga." Harper is also planning to add the Mimetics Frame Buffer, so that he can grab images from videotape.

Harper has an arsenal of Amiga programs, with dozens of the latest disks in a huge case by his Amiga 1000. Out of this enviable selection, he uses primarily DeluxePaint II, DigiView, an Easyl graphics tablet, J Forth and the Liquid Light Imprint system, which makes the slides he takes to conferences. His most important applications tool, however, is probably J Forth, which he uses heavily to transfer programs from the Vax PDP 11 onto the Amiga; Harper says, "the file structures are different, so transferring things to the Amiga will take some work, but it's worth it. The Amiga is blazingly fast; some applications run eight times faster on the Amiga than they did on the PDP 11. Having a wonderful programming tool like J Forth makes the Amiga look viable for us."

Another important applications tool is DeluxePaint II, which he finds "an astounding package. You can install a non-copy-protected disk on your hard disk. Copy protection that makes use of code words on different pages of the manual is too inconvenient. I was disappointed to see it on DigiPaint; that limits its usefulness to us."

The project also uses DigiView for directly inputting images into the Amiga; his custom setup uses two EBV-2 500-watt bulbs as a light source and is switching to a C-mount 35mm lens. The uneven lighting, however, is still a problem, so he plans to add some diffusers. Dr. Harper also uses Easyl for cleaning up slides; although he doesn't have time to filter pictures, he did find a free edge-detection program and Fourier transform program on a public BBS (bulletin board system). With this software, he can help students clean up pictures by offering advice on edge detection, high frequency or low-pass filtering.

One of the research project's goals is to create a brain image in three dimensions. Dr. Harper has not seen VideoScape or Sculpt 3D but is very impressed with Forms in Flight. He says, "For $79, it's ridiculous. I saw a demo and ran right up and bought it. It's astonishing that these things are being done on micros."

One project researcher is developing Amiga software for data acquisition of cardiac, lung and brain activity, which can then be recorded automatically on a hard disk. Later, the Amiga can process the data to get a better visualization of what is going on.

With all this software and hardware available, Dr. Harper is very pleased with the Amiga. He feels that "to get significantly better output than the Amiga, we'd need something like a Sun workstation with a Pixar rendering engine."

Other Amiga R&D Applications

The Brain Imaging Project is also investigating Sudden Infant Death Syndrome in conjunction with a London university. The London study took vital sign readings on 700 infants, 16 of whom later died. The research team has been analyzing these tapes of the 16 infants next to some healthy controls on the Vax PDP 11, but it is now in the process of porting the code over to the Amiga. Harper says, "With the PDP 11 we only have 64K of RAM; with the Amiga we have up to 9 megs, or 16 megs if we go to a 68020 chip. That's . . . heaven. The PDP 11 graphics card cost us almost $2,400, plus $600 for the monitor." The PDP 11 only has 16 colors in a 512 × 512 pixels display with no blitter chip, and Harper explains, "The Amiga has virtually the same res for a fraction of the cost. We can hook several Amigas to a hard disk and to each other through Ethernet using the Ameristar board, and boom!. . . away you go. What's really important is languages, networking and coprocessor boards. These greatly enhance the capabilities of the machine."

The UCLA Anatomy Department has also purchased an Amiga, along with the DigiView program, and is using it for teaching gross anatomy using digitized slides. With DeluxePaint II, the professors can alter the bare slides with shading or circles to point out any areas of interest, and 3-D packages will show such anatomy animations as muscle and limb motion. Dr. Harper adds, "There are some muscles the motion of which is very hard to explain with words, and still images just don't hack it. What you'd like to do is show the muscle and limb moving together or two muscles working in opposition. 3-D animation is perfect for this."

Besides teaching gross anatomy, the Amiga will be invaluable in teaching developmental biology. Harper says, "If we want to show fetal development or cardiac development, the Amiga is a natural with its excellent color graphics. And at only $750 for each color animation machine, it is very attractive."

Conclusions

Color computers are adding to our store of medical knowledge; the Amiga will expose medical students and physicians to aspects of physiology that are simply not available using traditional teaching methods.

In the words of Dr. Harper, "It's not just evolutionary; it's revolutionary. Inexpensive software and hardware make it possible for medical professionals to actually use things they wouldn't even have seen before. I think we'll be able to look at diseases in new ways. If you can see the brain in better detail, you get a clearer picture of how to treat it. With the Amiga, we're working to solve problems that were insoluble using traditional methods." ■

Write to Ben and Jean Means c/o AmigaWorld *editorial, 80 Elm St., Peterborough, NH 03458.*

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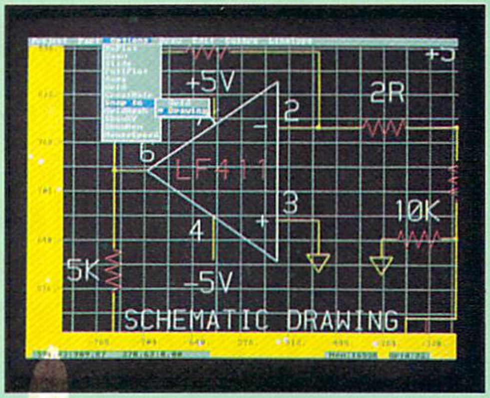
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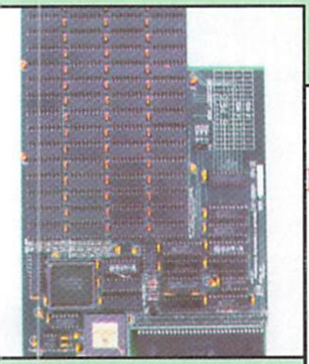
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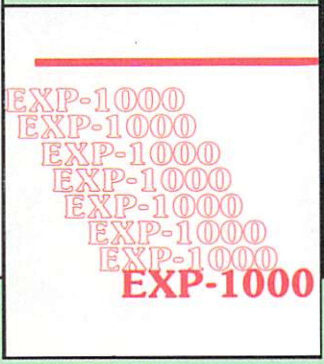


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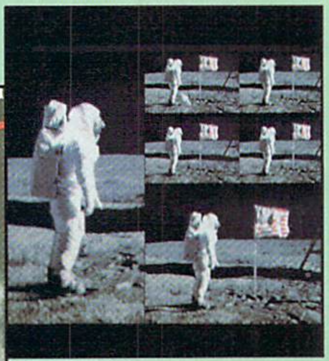
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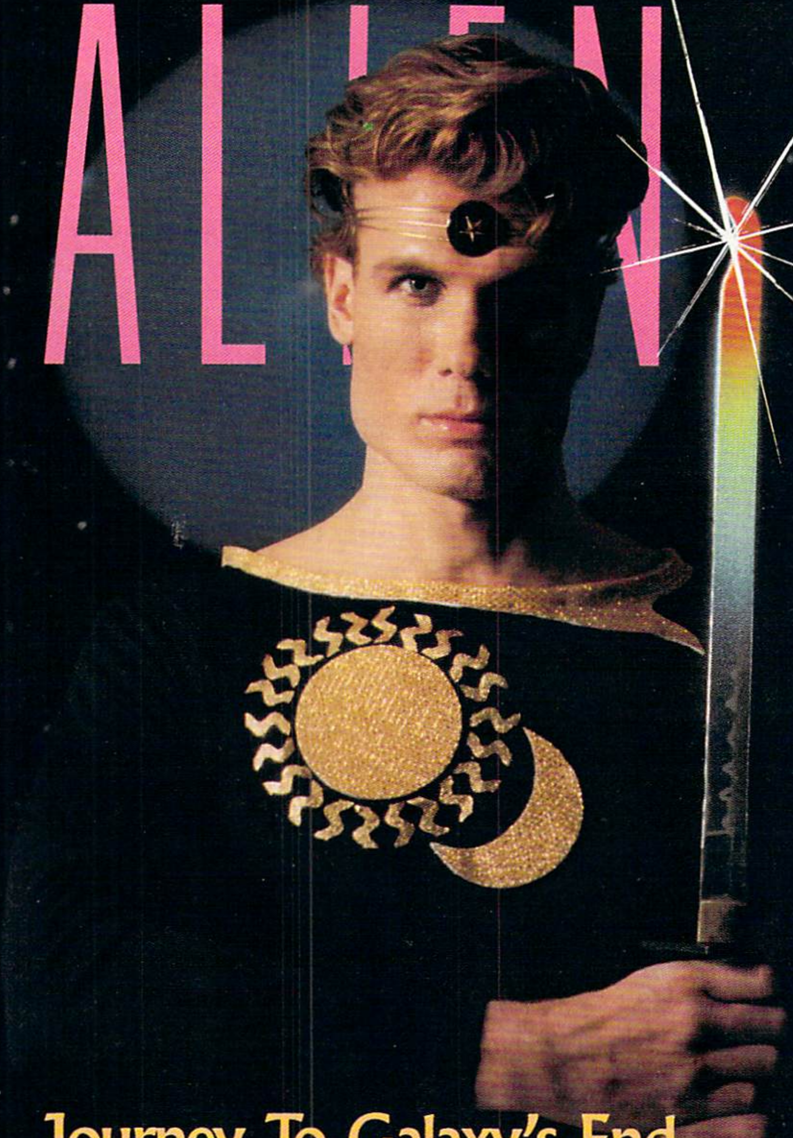
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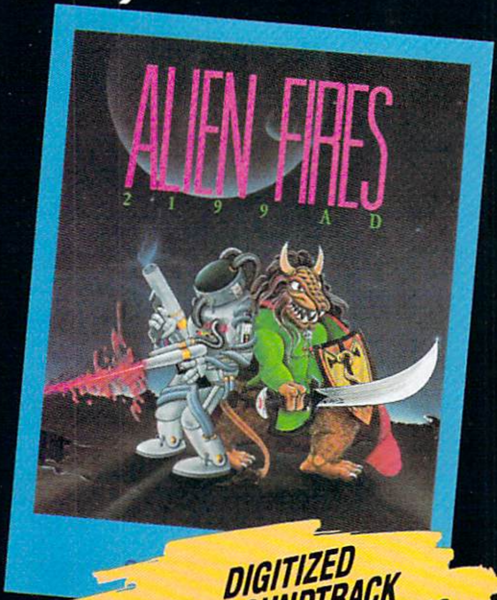
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Digi-Paint Prism Plus

Another artistic horizon has opened up for the Amiga.

By Roger Goode

UNTIL NOW, creating original paintings and changing digitized pictures has been limited to working in a maximum of 32 colors. Digi-Paint (from New Tek, the creators of Digi-View) and Prism Plus (from Impulse) are here to change all that. Both give you the ability to manipulate ("paint") pictures in the Hold-And-Modify (HAM) mode, making available a phenomenal 4,096 colors to help you create a more natural look. The key to having all those colors on-screen is, briefly, that each of the color pixels "borrows" information from its neighboring pixels to create additional colors. This process prompts the pixels to behave differently, which will require some getting-used-to, but for the virtually endless possibilities, it's worth it.

Digi-Paint and Prism Plus are not ordinary paint programs; in fact, the term "picture editing" more closely describes them. Both are IFF compatible, so importing picture files from DeluxePaint, Aegis Images, Digi-View and other sources is no problem. Both employ the "color 0" option to support a genlock. Backup disks can be made of each, but Digi-Paint uses password copy-protection which requires you to enter a random word from the manual before you start the program.

Digi-Paint

Digi-Paint comes with the program disk, which requires at least 512K of memory, and a well-written, 56-page manual. To the credit of Digi-Paint, I was able to get right into program almost without looking at the manual. The special features I did require help with are thoroughly covered in tutorials.

Before entering the program you are given the option of working in 320 × 200 or 320 × 400 resolution. The opening screen reveals the simplicity and ease-of-use built into this program. The basic menu items are handled in standard Amiga fashion, with one addition: when you load a picture, you may choose to use either the on-screen palette or the palette on file with the picture. This option is helpful when combining elements from different pictures. The toolbox, menu bar and the 4,096 color palette are situated in the bottom quarter of the screen for easy access. The toolbox will automatically disappear if you work into the lower portion of the screen, then reappear once you finish. You can also reposition it or click it off and on with the mouse. This all adds up to fast and fluid use of the program, which really matters when you're in a creative mood.

The toolbox contains a full compliment of the basic tools and brushes found in other paint programs—freehand draw, straight line, oval, rectangle, etc.—all of which can be used with the options in the Mode menu. It's under the Mode menu that you'll find Digi-Paint's distinguishing characteristics. The functions of many are self-explanatory, as with Solid, Blend, Tint and Shading. The more obscure Add, Subtract, And, Or and Xor do things like lighten the area affected, create a negative effect or shift the color affected in one direction or another. The rule here is *experiment!* The Effects menu houses Double Screen Size, Halve Screen Size and Mirror Flip Screen. ►



Artwork created with Digi-Paint's Rubthrough function. (Palette and menu bar at bottom.)

A function called Soften allows you to shift and overlay the screen by one pixel either vertically, horizontally or both, thereby giving the whole picture a slightly out-of-focus look. Other techniques include Cut and Paste, for making custom brushes and Again, which lets you repeat operations in different combinations for even more varied effects.

You'll discover, with a little experimentation, some features which are not in documentation. All the features allow use of multiple functions concurrently to provide some great effects. Colorizing, one of the nicest of these techniques, by itself justifies the purchase of the program. By using the Fill, Add, Tint and Shading tools you can very effectivly turn almost any black-and-white picture into full color.

I discovered my favorite feature while playing around. Like DeluxePaint, Digi-Paint allows you to copy a screen to a spare screen situated behind the first. Once you've copied a screen to the spare, the Rubthrough function becomes available. With Rubthrough activated you literally rub away parts of the image on the first screen to reveal what lies beneath. With a color picture on the spare screen, I cleared the first screen to a neutral, light color. Then I activated Rubthrough and Tint and Fill, and using a small, round brush I worked over the screen with small strokes until the picture underneath was revealed in light, transparent tones of the original colors. The effect is amazingly like that of a watercolor painting. By working stroke over stroke in the same manner, and adding further tints with the Rubthrough turned off, the illusion of watercolor painting is further enhanced.

I'm very impressed with the power of Digi-Paint; I found lots of potential for further creativity and enjoyment.

Prism Plus

The Prism Plus disk actually holds two programs—the original Prism! and the updated Prism Plus. I'll limit this review to the updated Prism Plus, except to mention that Prism! requires 512K or more of memory and Prism Plus requires at least one megabyte of memory. The reasons for this, I gather, are for the optional resolutions you can choose from (with interlacing and overscan) and the ability to use custom screens larger than the standard Amiga screen, much like DeluxePaint II. Be warned though, that the larger screens are extremely memory intensive (a 1,024 × 1,024 interlaced HAM picture uses 3.6MB).

Prism Plus is not the type of program you can use without reading the instructions, at least not if you want to take advantage of the special features. Right from the start I had difficulty, much of which I would have to attribute to the manual (the original Prism! manual with one page of amended instructions for Prism Plus). The manual is 24 pages long, only 15 of which are instructions; the rest is technical information, which I commend Impulse for including as it may be very helpful for some. However, for the far greater number of Amiga owners who want a graphics tool that is easy and fun to use, the important part of the manual is the basic "how to." In this area, I'm afraid Prism Plus falls short. I found the



Prism Plus' inverse function and toolbox.

explanations of the functions ambiguous and far too brief. Two pages are devoted to a listing of keystroke commands, each defined by just a few words.

The Regions menu, which allows you to Cut, Paste and affect defined areas in different manners, is what sets this program apart from others. Regions is covered within the Unique Operations section, the whole of which is just two and a half pages. While there is an additional section on Regions in the technical section of the manual, overall I found it, as I did the rest of the manual, to be cryptic and of very little help.

The basic operational setup is similar to other paint programs, with a menu bar at the top and a gadget box down one side. The tools in the box are familiar, too—brushes, freehand, straight and curved lines, hollow and filled shapes, flood-fill and text, airbrush and a magnifying glass that allows you to zoom in and out. The palette requester is large and nicely set up. There are a few new items not mentioned in the documentation, and this leads to more confusion.

The menus hold the special functions, including the controls for Regions which give you the ability to define areas to use as custom brushes, flip horizontally and vertically, swap information from the buffer area, create a transparent/negative image of an area for easier positioning of a brush and more. For most of these functions, as well as those of many of the tools in the gadget box, there are keystroke commands. Personally, I found them awkward to use; there are so many that I had to continually refer to the command iist.

It seems that Prism Plus has great potential. I was, therefore, disappointed to find it so difficult and ungainly to use. Perhaps if I'd spent quite a bit more time I'd have gotten a handle on it, but I spent roughly the same amount of time with Digi-Paint and already feel competent to produce nice work with it. As a professional artist, I value tools that allow me to work efficiently (especially as deadline time approaches!) and on that basis I recommend Digi-Paint over Prism Plus.

Digi-Paint
New Tek
115 West Crane Street
Topeka, KS 66603
913/354-1146
$59.95
512K required.

Prism Plus
Impulse, Inc.
6860 Shingle Creek Parkway #110
Minneapolis, MN 55430
612/566-0221
$69.95
1MB required.

VizaWrite Desktop

The waiting is over, but was it worth it?

By Louis R. Wallace

IF YOU WANT something beyond your grasp, you have to stretch to reach it. Progressive Peripherals & Software is stretching beyond word processing standards toward desktop publishing with VizaWrite Desktop. With VizaWrite you can not only organize text, but integrate graphics as well for a polished final document.

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Get) system, VizaWrite allows you to choose from a selection of modes—Bold, Italic, Underlined, Superscript and Subscript—thereby alleviating the need to memorize keystrokes and codes. You can also use any of the fonts and font sizes found in the Workbench Fonts directory, mixing different font styles and sizes on the screen much like ProWrite (New Horizons). You have the choice of working on the standard 640 × 200 screen or the interlaced 640 × 400 screen mode.

Graphics Integration

As the Desktop part of its name implies, VizaWrite allows you to incorporate IFF graphic images anywhere within a document. One of the most interesting and useful aspects of VizaWrite is that it permits you to quickly enlarge, reduce or distort (horizontally or vertically) the IFF image after it has been placed on the page. However, enlarging an image can make it appear grainy, while reducing may cause it to appear crude. I found VizaWrite sometimes crashes while resizing, so you should be sure and save your document before changing a graphic. These system crashes usually occurred when the VizaWrite workspace was nearly full.

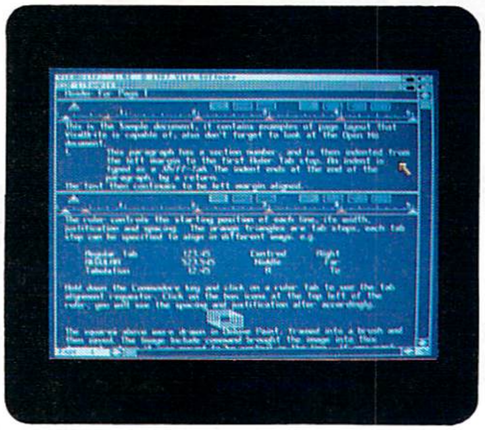
Since VizaWrite use a Workbench-style screen (two bitplanes, four colors), multicolored graphics are converted to single-color images. Unlike ProWrite, which attempts to map its graphics to those colors available, VizaWrite does not map the image's color into distinctive patterns or shades. In fact, VizaWrite correctly reproduced only the simplest single-color images; most became single-color blobs that bore little resemblance to the original beyond the outline. Because of these problems, the ability to include graphics within a VizaWrite document is much more limited than I expected.

VizaWrite has all the features considered standard for word processing programs. You can change margins, line spacing or text alignment quickly and easily by using the mouse to place one or many rulers anywhere on a page. It has the ability to include headers and footers on a page, but there is no provision for footnotes. The Cut, Copy and Paste functions enable you to move and delete sections of the document; you can select words, lines, sentences or paragraphs using the mouse or keyboard, but the Select Whole Document feature did not work on the 1.02 version I used.

One particularly useful feature of VizaWrite is its ability to perform mail merges. This means it can print one document (such as a letter) any number of times, interpolating variables (such as names and addresses) into predetermined slots with each printing, thus creating customized versions of the document. You can use any ASCII file containing the variable data as long as it is properly formatted.

Another useful feature, the Glossary, allows you to create a file of graphics and sections of text that you wish to include in other documents. You can choose an item from the glossary and include it anywhere within a document, where it can then be edited along with the rest of the contents.

Search-and-Replace allows you to exchange a letter, word or phrase with another, once or many times. There is a serious bug in this option, however, that caused the system to crash several times. The only escape was to reboot, which of course caused loss of the document in memory. Even when Search-and-Replace works though, it is slow.



Graphics and multiple rulers in VizaWrite.

On the subject of speed, I should mention that VizaWrite is extremely slow at updating the screen—even more so than packages such as ProWrite, that use more bitplanes and hence must move more memory. Progressive Peripherals's technical support line attributed this sluggishness to the Amiga, but since other packages don't have this problem I cannot accept that as fact.

One feature I especially like is the History box. Along with each document, VizaWrite stores corresponding information, including who created it and when, and its size. Here you can include a note about the document. More importantly, it allows you to password protect your documents so that only you can access them.

Printing Puzzles

VizaWrite allows you to print your documents using proportional spacing or a specified pitch. Choosing one of these options, however, cancels its ability to print any Amiga fonts you may have chosen; to print the document as it appears on screen you must choose the screen option.

Don't buy this package thinking that your printer will work with VizaWrite just because your printer works with all your other Amiga programs. The fact that this program disregards Preferences printer drivers and instead supplies its own results in a very serious weakness. At this time VizaWrite supports only seven printers: CBM MPS1000 and 2000, Diablo 630, EPSON FX-80 and FX-85, HP Laserjet and Juki 6000.

VizaWrite is unprotected, it multitasks, and uses a configure file that determines which default disk and fonts to use, as well as how much memory to allow per document. The default is set at 40K, enough for about 12 pages, but it may be expanded.

VizaWrite Desktop has a lot of potential. While it has a good user interface it is hampered by slow screen update, and although it offers very useful features it also has some serious bugs. Considering its cost in comparison to other Amiga word processors, I just can't recommend it. If it's graphics and multiple fonts you require, ProWrite is more effective. If you need mail merge or want to work on large documents, WordPerfect, while more expensive, is a far better choice.

VizaWrite Desktop
Progressive Peripherals & Software
464 Kalamath Street
Denver, CO 80204
303/825-4144
$149.95
512K required.

Calligrapher

Fabricate fabulous fonts to fascinate the most fastidious of fans.

By Chris Dickman

CALLIGRAPHER DOES JUST one thing, but does it well. Designed specifically to create fonts in up to 16 colors, it will appeal to those using Amigas professionally for video production or design work. In a nutshell, Calligrapher provides a neatly linked series of editing tools to create and modify fonts, from the standard two-color

variety up to a 16-color genre dubbed ColorFonts by the program's creator, Inter/Active Softworks. Commodore's acceptance of ColorFonts as a font standard, coupled with Inter/Active's artist support program, should result in a proliferation of fonts in this format.

Calligrapher occupies almost every nook and cranny of its disk, so much so that the C directory has been almost completely gutted. As goes disk space, so goes memory. Calligrapher requires at least 512K, but you'll need one megabyte to create multicolor fonts of reasonable size. Memory is in such short supply on a 512K system that Calligrapher lets you monitor available memory and close the Workbench if necessary, saving about 35K. This puts the kibosh on multitasking, however, so a multi-megabyte system is clearly in order.

Creating fonts with Calligrapher involves moving back and forth between the program's six screens. You begin with the Font screen, by either loading part or all of an existing font to be modified or creating one from scratch. Setting the size, number of colors and range of ASCII characters to use in the font is a painless process of clicking on the boxes displaying the default or existing values at the bottom of the screen (keep in mind that increasing the size of any of these parameters will eat up more RAM).

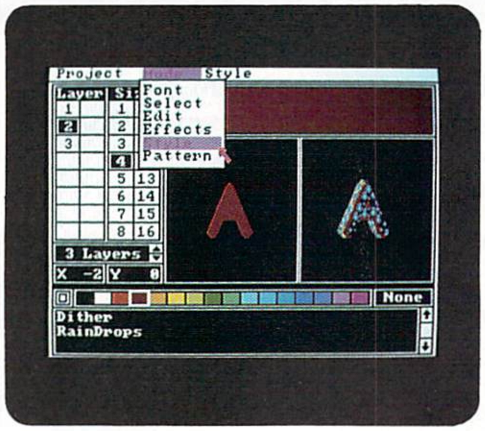
As an example of the attention to detail that's gone into Calligrapher, placing the pointer on the value in the height box, clicking and moving the mouse upward raises the height value and the opposite lowers it. Using the left button scrolls these values slowly, the right one does it quickly. Little touches like this are scattered throughout the program and make it a pleasure to use. The Amiga keys are not employed and the use of icons is refreshingly restrained, with the program relying instead on the intelligent use of function keys, menus and gadgets.

All Characters, Line up Here!

The Font screen is the only one which provides a viewing capability for groups of characters. A pop-up window enables you to type a line of text and view it in four screen resolutions, including interlaced. Text entered on the screen can also be sent to video tape with the aid of a genlock. You can perform a wide range of operations on groups of characters, including converting a group to a single brush and copying it into a single character of a font, or saving it to disk. This is handy for creating and modifying logos and titles, since you can apply the special effects normally used with individual characters to the entire word at once.

The place to start modifying the font is with the Edit screen, working on one character at a time. The process will be familiar to DeluxePaint users, since the screen is basically a subset of that popular paint program—similar brush, line, box, fill and magnify tools are present, as well as a pop-up palette. Even the keyboard shortcut commands mimic those of DeluxePaint. This consistency between programs is commendable.

Beyond the paint tools, the Edit screen provides a few ingenious ways to work with characters. Each one is displayed surrounded by lines that end on the edges of the screen in small triangles. Clicking and dragging these triangles moves the lines, which correspond to the baseline, spacing, kerning and width of each character. A decimal value for each of these attributes changes along with the lines, for accurate positioning.



Calligrapher's style screen.

Great Effects

Playing with patterns on the Effects screen is fun. A pattern can be created from any IFF brush drawn with an Amiga paint program and range in complexity from a few pixels to an image 160 × 256 wide. Once loaded, the pattern is displayed and can be modified in a number of ways, including color, alignment and style. To make use of a pattern, it's over to the Style screen.

Style is a busy screen that's used not only to transform characters by adding outlines, shadows and patterns, but also to convert standard two-color fonts to ColorFonts. A style is composed from up to 16 stacked layers. You can define the color, placement, size or pattern of each layer separately and save the resulting style definition or attach it to any font. During the creation of a style, what's displayed on the screen is not the actual characters of the font but a generic letter 'A' in two adjacent windows. The left represents the current layer, the right the character with all the layers displayed. Changes made to the current layer are faithfully displayed on the right.

Moving each layer is as simple as clicking and dragging the 'A' representing the current layer. You can also apply any colors from the current palette to any layer and change the palette as desired. A list of patterns loaded from the Pattern screen is displayed at the bottom and can be applied as required, one for each layer. The temptation is overwhelming at first to create and load multiple patterns and create multi-layered fonts. This produces some wild results but, reality, in the form of an insufficient memory warning, soon rears its ugly head.

To see how the actual font will look, it's off to the Select menu, to view the effects of your tinkering on one character or the whole font. Making these changes permanent is another memory-hungry operation.

Space doesn't permit examining all of the many tools Calligrapher provides for color font creation. The program provides so many features that it takes careful reading of the well-written manual and quite a bit of practice before some of the more intricate procedures become second nature. For example, it takes literally dozens of steps to transfer characters from one font to another. But if you rely on the Amiga for your livelihood in the field of video or graphic design, Calligrapher will quickly become essential equipment.

Calligrapher
Inter/Active Softworks
57 Post Street #811
San Francisco, CA 94104
415/956-2660
$100
512K required.

Forms In Flight

Take off in 3-D.

By Louis R. Wallace

WHILE 1986 WAS the year of paint and animation, 1987 is the year of 3-D. Forms In Flight by Micro Magic is a drawing program that allows you to create three-dimensional objects by drawing them or inputing the co-

ordinates directly. It supports hidden line removal and solid shading of the objects as well as simple wire frame models.

Forms In Flight requires at least one megabyte of memory, but even more is recommended. A one-meg system can display up to 600 four-sided surfaces. Since each additional megabyte adds about 1,700 additional surfaces, a fully expanded Amiga can generate highly detailed objects. A hard drive is recommended, but not required.

With pull-down menus you define, create and control your objects. You can use either the 640 × 200 or 640 × 400 screen (in two, four, eight or 16 colors) to create your images, but once you have recorded a sequence of views, any resolution screen can be used for playback. The 3-D image will be maintained in the proper proportions regardless of the playback resolution. The animation sequences are designed to be recorded using a video frame recorder, but Micro Magic has just released a special player program called Fast Flight (included in the Forms In Flight package) that, using the Amiga's RAM memory and very efficient compression algorithms, allows you to play back the animations in real time.

Beginning with Basics

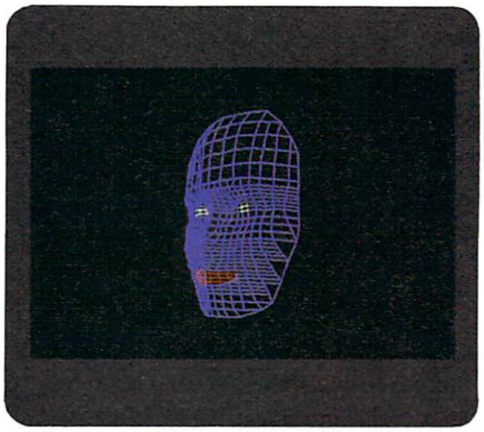
You design objects by building them from a basic structure, the polygon. You have three types of polygons to choose from: freehand, regular and spline. These can be drawn directly in 3-D, but more control can be had by first creating it in a 2-D plane, then expanding it into three dimensions. For example, if you create a 2-D six-sided circular polygon, then extend it into the third dimension through a given number of steps, you have created a 3-D six-sided cylinder. This is faster than actually drawing the entire 3-D object, and is more precise for symmetrical objects than you may be able to generate by hand. Forms In Flight can then remove those lines that would be hidden if the object was solid, a process called hidden line removal. The program also allows solid shading of the objects (using a variable light source), and the final result can be stored away to disk as a library object.

Simple objects stored in libraries can be combined into complex objects which can in turn be used to generate even more complex images. Objects can be manipulated, using techniques such as copy, mirror image and rotation. These manipulations can be performed on the whole object or selected sections of the object.

Rotation is handled in several ways. You can move the observer by a simple rotation, or by more complex action such as rolling or panning. Rotation causes the observer's "eye" to move around the object in space, giving you a different point of view, but you remain looking toward the same point (look point). Panning means both the observer's eye and the look point change. Rolling means the observer's head moves, giving a new look point but still using the same 3-D view. And you can zoom in towards or pull away from the object, changing its relative size on the screen.

Now, Move It!

Animation is accomplished by defining how each object is to move in a given sequence during a defined number of frames. When animating complex scenes using more than one object, each can have its own anima-



A wire frame face from Forms In Flight.

tion control and move independently of the others. If you want an object to rotate, select it. Then using menus, set the direction of rotation, the number of frames and the number of degrees to rotate in these frames. Once a frame block (the number of frames in an animation sequence) has been defined, the next frame block can be determined. When you have finished defining the animation sequence, it can be made to occur on the screen. Depending on the complexity of your objects, this can take a few minutes or many hours. If it is going to take a long time you can have it save the frames to disk, where they can be replayed for recording on film or just viewing to see the effects.

While Forms In Flight does not support screen dumps to dot matrix printers, it does support plotting on HP-GL or compatible plotters. These have an output resolution of 10,240 × 6,400 dots, allowing a very precise and detailed drawing of your objects. Unfortunately, most users don't have such a plotter, but most of them do have printers, so a dot matrix screen dump (while quite a bit cruder) would still have been a desirable option.

As mentioned, Forms In Flight is controlled via the mouse and Intuition menus. These make it significantly easier to use than a program that would use the CLI style approach (as many MS-DOS packages do). But three-dimensional graphics are quite complex, and even given the ease of use of the Amiga's interface, it remains a challenging task, requiring a strong background in 3-D geometry to really create anything. It also requires you to have a firm vision of what is being created. This includes both the objects' shape and form and, in the case of an animation sequence, what you want the results to be. These are talents usually found in artists and animators, so I think the best results will be had by users with both a technical and artistic slant.

The documentation is fairly extensive, and at first glance it might seem a little bit obscure. But with a little practice, using the supplied tutorial in the manual, you can quickly get the hang of creating simple objects. More complex images will require quite a bit of reading, patience and more than a little practice. All in all the manual and menus are adequate, but they're not exceptionally well done.

There are a couple of features I would have liked added to the package. For one, I would like to have the ability to save the screens in an IFF format, so they could be used in other Amiga programs. While this could be done using a background task like Grabbit (Discovery Software), a simple menu option would have been better. I would also have liked to have the ability to load IFF screens to be used as backdrops for the animations, an ability offered in almost all other animation packages, 2-D or 3-D. This is especially important if you are recording the animation on film. And while I thought the menus were functional, they were not exceptional in any way. More creative gadgets and a better use of color in the menus would have made them somewhat easier to use and somewhat more pleasing to the eye.

With those minor complaints aside, I like Forms In Flight. I have done a fair amount of three-dimensional graphics programming and can appreciate the work that went into this package. It is quite fast in its hidden line removal, and the solids modeling capability allows it to be used for a variety of personal and professional tasks. I am having a lot of fun using it, and if you are in-

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Facc
Facc II

Disk access so speedy you'll wonder, What was that masked program?

By David T. McClellan

FACC, ASDG's "Floppy ACCelerator," speeds up disk access by some behind-the-scenes maneuvering. It intercepts disk reads and caches disk blocks in memory as they are read from the disk, adjusting which blocks are cached as disk usage changes. When a program rereads the disk blocks, Facc returns the in-memory copy without ever touching the disk, so the second and later accesses of a previously read block are nearly instantaneous. Likewise, when a block is written to disk, Facc keeps a copy of that block in memory and returns it when subsequent read requests are made. If you think that you wouldn't have much need for such a program, consider how useful Facc would be in the edit/compile/link/test cycle; after you edit a file, the compiler rereads it and then writes an object file which your linker immediately reloads. Facc would also be helpful transporting graphics. These are only two of its applications.

Abundantly Effective

While AmigaDOS provides AddBuffers, a cache-like CLI command, AddBuffers is not nearly as flexible as Facc. Facc continuously adjusts the number of buffers per disk as your usage changes; AddBuffers requires that you set a pool size for each buffer, which remains fixed until reboot. Additionally, Facc runs in either Chip or extended RAM (it can even be cancelled if memory runs very short), but AddBuffers must be run in Chip RAM, the lower 512K.

The effectiveness with which a program is able to handle the aging of cached blocks is one method of determining its intelligence. Facc fares well in this regard. When the cache is full and the program reads a previously unread block, the program must determine which of the current caches should be eliminated to make space. Facc applies the LRU (Least Recently Used) algorithm procedure, the most effective I know of.

Put to the Test . . .

I tested the speedup by running MicroEmacs over the same file several times from the CLI and checking the loading time for both the editor and the 18K file. Although it incurred a slight overhead (3.5%) on the first access of the files, Facc cut load time down by more than 70% on subsequent tries. With expansion RAM, you will get similar savings with larger utilities while keeping all your Chip RAM free.

Facc is very effective on machines with a megabyte or more of expansion memory. With limited memory however, it is not possible to get real gains from it for large files.

There are three potential traps to be aware of. If a file being read is larger than the cache, blocks are aged out before they can be read a second or third time. To ►

avoid this simply increase the cache size. Also, when you pop a disk from its drive, Facc discards all cache information for that disk even if you immediately re-insert it. This is necessary; there is no other safe way to prevent disks from being corrupted with data blocks from the preceeding disk. Facc keeps a window open after you load, to enable you to interact with it from the Workbench. The window can be resized and hidden, but closing the window will shut down Facc, too.

Facc is very easy to use and does what it says. ASDG continues to support the program, and has just introduced Facc II. Free to all registered Facc owners, the update adapts to low memory situations and frees up parts of the cache. It can run without a window and allows its buffers to be tailored by your own programs. If you have any expansion memory, Facc is a good investment.

Facc
Facc II
ASDG Inc.
280 River Road, Suite 54A
Piscataway, NJ 08854
201/540-9670
$34.95
512K required.

KickWork

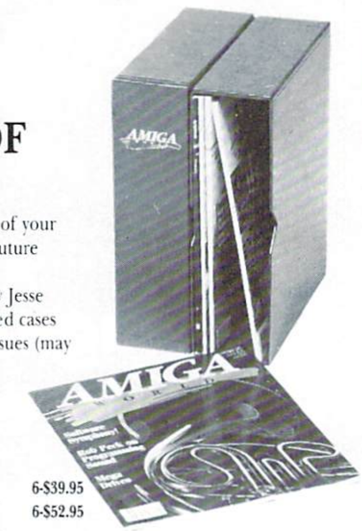
A1000 owners—kick up your heels! KickWork is here!

IF YOU'VE OWNED your Amiga 1000 for more than a week, you're probably sick to death of the ol' two-step (Kickstart and Workbench). It's unreasonable that it should take two disks and about a minute to boot a computer renowned for its speed and ease of use. Now, with KickWork, 1000 owners can boot to Workbench with one disk and put their dancing shoes away.

KickWork includes a disk and a 10-page manual. It requires that you have the Amiga Enhancer kit with Kickstart 1.2. If you haven't upgraded to 1.2, Amigo Business Computers will sell you a combined Enhancer/KickWork package. The verion I tested was 1.10. It didn't supply Kickstart on the disk; rather, to avoid copyright infringement it reads Kickstart from memory to create the single-disk boot system.

Rescued
Following the instructions provided, I booted my 512K A1000 with a standard Kickstart 1.2 disk and then inserted a copy of the KickWork configuration disk at the Workbench prompt. The configuration disk creates the KickWork disk. Everything went along nicely until a message cropped up stating that I had insufficient memory for the Kickwork.Maker program. Since the manual states that 512K is required, I was puzzled by the program's refusal to run on my 512K machine. After checking my 256K chip RAM module for a loose connection and removing my external drive to free up more memory, I tried the program again, and again I was informed that I had insufficient memory.

At this point I called Amigo Business Computers to get some help. I was careful not to identify myself as a reviewer. The person I talked to explained that version 1.10 had never been run on a 512K machine. It was developed and tested on computers with expansion RAM, an oversight that is understandable given the popularity of RAM expansion devices for the Amiga. To get the configuration program to run on a 512K machine, I was instructed to make a fresh copy of the configuration disk and to change the name of the startup-sequence file on the disk. Now, when I booted the configuration disk, I was dumped into ►



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AmigaDOS since there was no file called startup-sequence in the s directory. The person from Amigo then instructed me to run the configuration program by typing kickwork.maker. Once this program finished, I turned my computer off, waited a few seconds, and booted flawlessly to AmigaDOS with just that one disk. I bid adieu to Amigo Business Computers.

I next checked the s directory of the KickWork disk and examined the old startup-sequence file. I figured that the memory problem I first encountered was the result of this file spawning too many CLIs. I also found a file called Startup-Real. When I renamed this Startup-sequence and rebooted, the system booted straight to Workbench. The old startup-sequence renamed this file Startup-sequence as part of the automatic configuration process. Since I didn't have the memory to run the automatic process, I used the CLI to rename the file.

From then on, my KickWork disk worked everytime I used it. I had no trouble running other programs such as WordPerfect, Mean 18 and Earl Weaver Baseball when I booted with KickWork. I also didn't have to run any strange programs to change the disk back into a Kickstart disk after booting, as is the case with at least one public-domain single-disk boot system. KickWork worked like a charm.

Kickstart takes up a lot of room—your computer, after all, uses a 256K writable-control store to house it. Because of this, you need a slimmer version of the Workbench disk to insure that Kickstart and Workbench can fit on the same disk. The KickWork disk contains just such a slimmed-down Workbench.

The KickWork disk eliminates the Demos drawer entirely. It also eliminates the alternate keymaps, most of the printer drivers, and all fonts except Topaz that are found on a normal Workbench disk. I never noticed the deletions.

I recommend KickWork to just about anyone with an A1000. It is far easier than installing Kickstart in ROM and nearly as useful. The fact that the configuration disk which contains KickWork won't work on a 512K machine is a serious flaw, but it is rectified by the excellent customer service supplied by Amigo Business Computers. They have already introduced a corrected version, and Amigo will supply the update, upon request, to those who have purchased the original. People with one disk drive may find KickWork limiting since there is no room on the disk for any applications programs. If you have two drives or a hard-disk drive, KickWork is a must.

—B. Ryan

KickWork
Amigo Business Computers
43 Harbor View Drive
Northport, NY 11768
516/757-7334
$29.95 ($39.95 with Amiga Enhancer Kit)
512K required.

Game Shorties

Karate Kid Part II

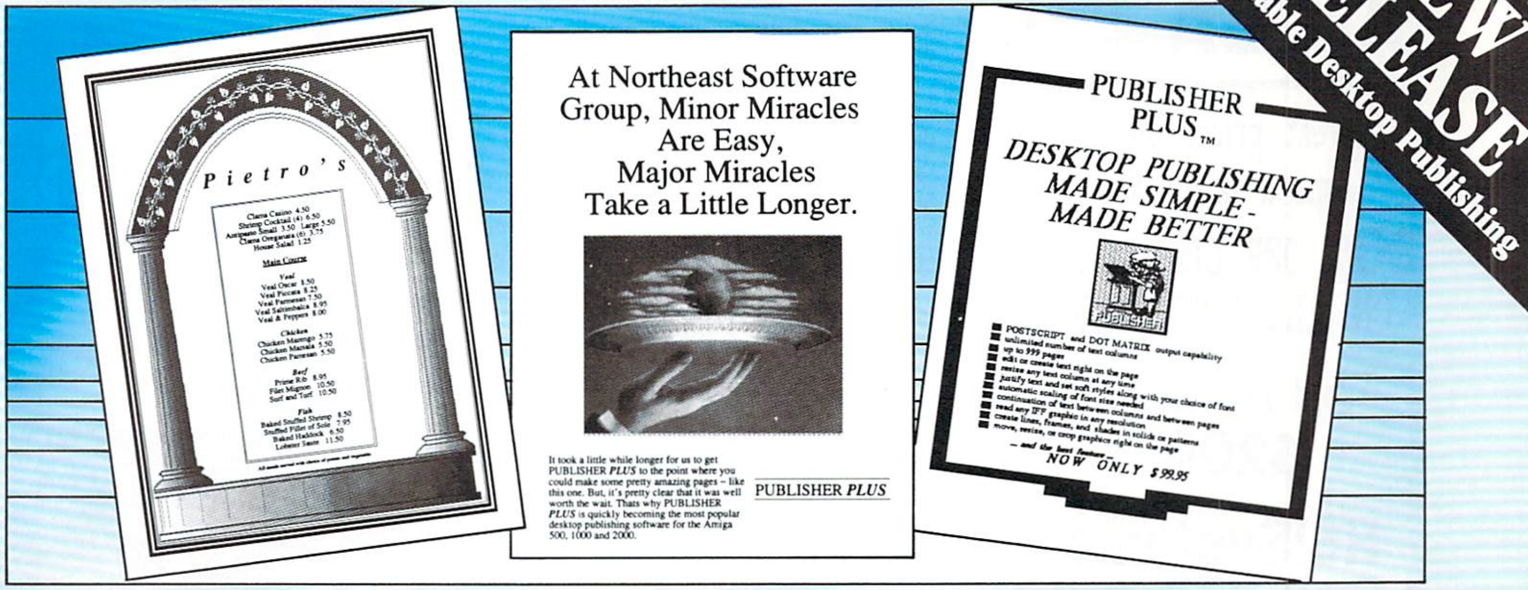
SPAWNED BY the movie of the same name, Karate Kid Part II lets you control the fortunes of Daniel LaRusso as he chops, punches and kicks his way towards an encounter with the evil Chozen in the Castle of King Shohashi. To get there, Daniel-san must get past opponents of increasing skill, until he faces the challenge of the drum.

Getting there is a very large portion of the fun. Each one-screen scene pits Daniel against a new opponent in a new setting. To drive his foe out of the picture, Daniel must use his arsenal of karate techniques. Some of the many joystick-controlled maneuvers are Forward Somersault, Kneel and Punch, Turn and Punch, Flying Kick, Sweep and Back Kick. My favorite is the Roundhouse Kick (the only way I can turn Daniel around). By pressing the button and pushing the joystick towards eleven o'clock, Daniel pivots on one foot and twirls, aiming the other for his opponent's head.

After every two opponents, Daniel has a chance to rack up some points in one of three bonus screens. In the first, he chops through a block of ice; your points depend on how many sheets are broken. The second is a simulation of disciplined concentration, as you try to catch a buzzing fly by using only chopsticks. Both are interesting ideas, but since they are really exercises in joystick maneuvering they are less enjoyable than the rest of the game. The third bonus is the Castle of King Shohashi, which I have yet to succeed in reaching.

The game's graphics are splendid. Each

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screen shows a different Oriental setting. Similarly, the animation is extremely well done, with the kickee sprawling in various, realistic ways. Sounds (the customary grunting and a couple karate yells) are unspectacular. Most impressive is the Oriental feel of the graphics, as the artwork is detailed and highly attractive.

The problem with the game is its arcade emphasis. There is simply not enough variety in Daniel's activities to make the seemingly endless succession of screens interesting. After a while the whole thing grows tedious, especially as the opponents become almost unbeatable. Furthermore, there is no Save feature. No matter how far you get, one loss sends you back to start from scratch. Classic arcade programming, yes, but I wish the adventuring aspects had been emphasized.

Karate Kid II is challenging and, at least for a while, entertaining. If you like arcade fighting games you'll be pleased. As it stands, though, I can recommend it only half-heartedly. The graphics and animation alone, even with the well-executed karate simulation, are not enough to sustain interest. *($39.95, MichTron, 576 Telegraph, Pontiac, MI 48053, 313/334-5700. Joystick and 512K required.)*

—Neil Randall

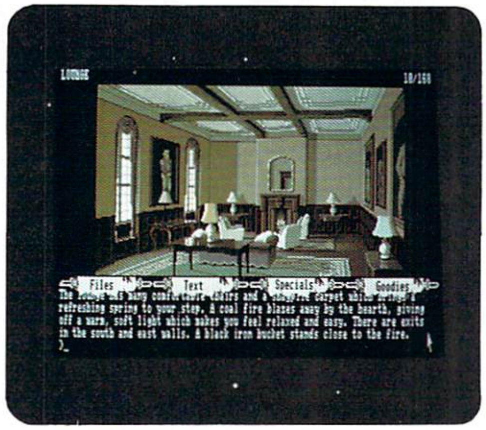
The Guild of Thieves

YOU JUST CAN'T steal good help these days. We are back in Kerovnia, and the Guild of Discreet Entry and Removal Operatives, otherwise known as the Guild of Thieves, is looking for a few good crooks. The quality of new members has slipped in recent years so the Guild developed a series of tests for apprentice thieves. They then revised the test when it turned out that no one could live through it. The new and improved version involves (what else) thieving, snooping, cheating, skulking and, most important, surviving the test.

It isn't easy surviving in Kerovnia especially when you are expected to ransack a well-guarded mansion, rob graves, fish without a license, cheat, lie and generally behave like a scoundrel. There are dozens of obstacles ahead for the would-be cutpurse—ravenous rats, caged bears, booby-trapped beds, garrulous guards and on and on. If you do manage to slink your way through the various tasks then perhaps you will be admitted to the Guild.

Guild of Thieves is a high-quality illustrated text adventure. The graphics are very good. The parser is very sophisticated. Pull-down menus let you change text size, save and load games, print your sessions, turn the Amiga's speech on and off and more. Guild of Thieves lets you program the function keys to type often repeated actions. There is a mini editor for changing your commands if you make typing mistakes. Guild of Thieves (like The Pawn, also from Firebird) has just about every feature you can think of in a text adventure game.

The game itself is difficult, enjoyable, complicated, rich, humorous and challenging. It is one of the least "restrictive" text adventure games giving you the feeling that



A nice place to break and enter.

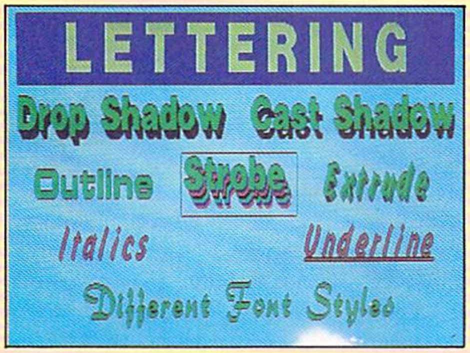
you can wander around at will, and that just because you get stuck on one puzzle doesn't mean you have to quit the game. There are clues in the game if you do get stuck; find the general problem in the list of clues printed in the manual, type in a string of gibberish, and the translation is printed to the screen. This is a good system because it prevents you from "accidently" reading the clues, and the strings you type in are so cumbersome to enter that you tend to not ask for help unless you are really stuck.

Guild of Thieves is not the perfect text adventure but it comes close. The story and setting are well done, the puzzles are challenging, the graphics are good, there are many extra features that aid in play and the program is very polished and professional. If you liked The Pawn, you will like Guild of Thieves. If you like text adventures, you will like Guild of Thieves. If you like puzzles, fantasy and humor, you will like Guild of Thieves. Unless you hate typing you will probably like Guild of Thieves, so why not go out and steal a copy today. (If you're good enough, that is.) *($44.95, Firebird Licensees, 71 Franklin Tpke., Waldwick, NJ, 201/444-5700. No special requirements.)*

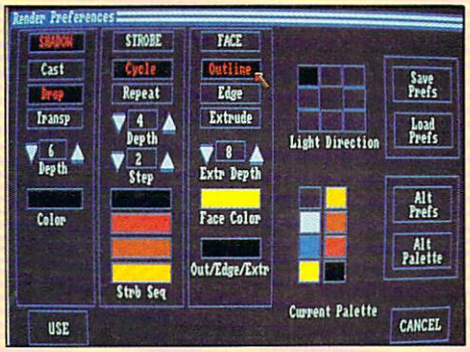
—G. Wright

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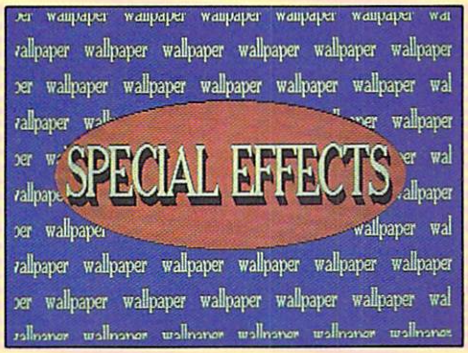
- easy-to-use menus
- select shadows, colors, lighting
- choose palettes and colors

SAVE $50,000! **TV*TEXT** brings capabilities of the most expensive character-generators to you and your Commodore-Amiga personal computer. Pocket all that money while you create professional quality lettering for presentation graphics, or live video production with Genlock. **TV*TEXT** supports the mouse, medium/high/overscan screen resolutions, the full Amiga palette of 4096 colors, all IFF images, and NTSC/PAL video standards.

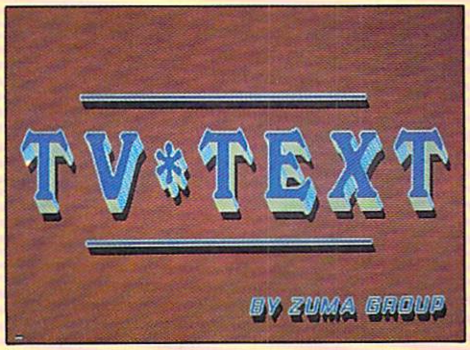
You can use any Amiga fonts, such as Zuma Fonts, workbench fonts, etc. Spacing can be adjusted and characters can be stretched, squeezed or even rotated! Text can be positioned with left/right justification or centering.

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What's New?

Our suitcases practically burst bringing back all the new goodies we found at AmiExpo.

Compiled by Linda Barrett and Barbara Gefvert

A Real Sin

"Desktop video is fine," the skeptics say, "but can you broadcast it?" Mimetics is loudly answering "Yes" with their **ReaSyn** frame buffer board and **FrameCapture** board. Conforming to NTSC RS-170A specifications, ReaSyn stores over two million colors in a broadcast quality image with 640 × 480 × 8 bits per color per pixel resolution. Stored files are compatible with IFF, hi- and lo-res HAM, interlaced and noninterlaced files. Since it contains a megabyte of 120-nanosecond dynamic memory, the frame buffer board doubles as a one-meg RAM disk. The FrameCapture board lets you trap single-frame images in real-time from a camera, a video or television for use with any of the animation programs available. ReaSyn is priced at $699.95, while FrameCapture is only $199.95. For more information, contact Mimetics Corp., PO Box 60238 Station A, Palo Alto, CA 94306, 408/741-0117.

SHAZAM!

It's a bird! It's a plane! No, it's **ComicSetter**! Create your own superhero adventures with clip art, word balloons, comic fonts and 16 colors. Gold Disk Inc. will surrender a copy for $99.95. Swoop in or call them: PO Box 789, Streetsville, Mississauga, Ontario, Canada L5M 2C2, 416/828-0913.

Busy Hands Make Many Products

The folks at Progressive Peripherals & Software have been dreaming up lots of ways to make your life easier!

Complete with its extensive programming language, **Superbase Professional** is here. Included are the Text Editor, which offers features needed for most word processing tasks, and the Forms Editor, which allows you to design multi-page forms with lines, boxes, color and text. The program costs $299.95, but if you own Superbase Personal, the upgrade will be only $125.

Progressive is implementing the Official Superbase Information Network (OSIN), a 16-line, 24-hour bulletin board system for user technical support. A pro-forum area will be provided for registered applications developers.

PIXmate is an image processing and special effects package. It performs 3,000 special effects, supports all Amiga graphics modes (including HAM, overscan and HALFBRITE 64-color mode) and can convert images from one format to another. For $69.95 you can enhance images and accelerate your graphics processing speed.

You get three points if you guessed that **IntroCAD** is an introductory CAD system. Besides offering standard professional CAD features, the program adds quad-density multilevel zoom and laser-like output. IntroCAD supports many printers and plotters, and is priced at $69.95.

The new compact external drive for all Amiga models, **ProDrive**, features a spring-loaded door to protect it from dust. With its 27-inch power cable, ProDrive costs $239.95.

Write to Progressive Peripherals and Software Inc. at 464 Kalamath Street, Denver, CO 80204. For information on the BBS you can call 303/9629-OSIN; for other questions dial 303/825-4144.

Stick to the Script

A script-based sequencing program, **The Director** lets you combine IFF image files, ShowAnim files, page flipping (of full or partial screens), sound and special effects into a professional-quality animation. Enhancements include Fade, Dissolve, Blit, Wipe, Stencil Move, Draw, Circle, Ellipse, Rectangle and Fill. If your presentation still isn't fancy enough, you can add color cycling or text in multiple fonts. All graphics modes, including HAM and overscan, are supported. The Projector program lets you play back your creations.

On the script writing side, The Director offers double buffering, integer numeric variables, a configurable array, arithmetic expressions, string handling and a random number generator. You control the path of the script with BASIC-like commands, such as For/Next, Gosub/Return, Goto and If/Else/Endif. The Director is not copy protected and sells for $69.95. Direct your questions to The Right Answers Group, Department E, Box 3699, Torrance, CA 90510, 213/325-1311. ►



A frame from *Contact*, created with The Director for PBS.



Now you can produce your own animated presentations on the Commodore-Amiga or video tape. Use any IFF pictures and over 50 exciting transitions including rolls, reveals, wipes, flys, fades, color cycling and more. Each picture can remain on screen for a preset time or until a keyboard entry is made. Now really get fancy. Fly or wipe object brushes onto the screen. Experiment all you want — you can play any portion of your script at anytime during your editing session! Incredibly easy. Lights, camera, ACTION!

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Kills Bugs Fast

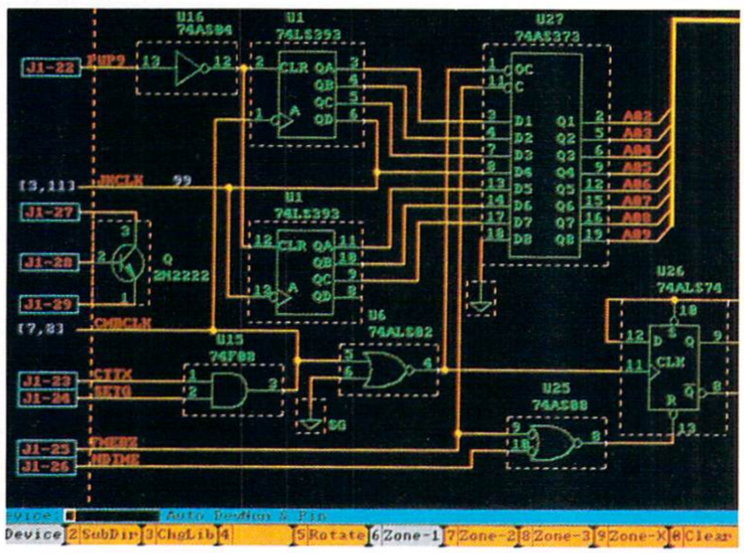
Featuring the Manx Aztec SDB, **Aztec C68k Version 3.6** is the Amiga's first C-level system with a source-level debugger. The developer system includes all standard debugger features, plus reusable command macros and procedures, active frame context switching (to examine variables from any active function) and back tracing. For convenience, the program makes use of windows, and tracing can be accomplished by line or function.

The developer system is priced at $299; if you prefer only the standard features, the professional system is available for $199. The source-level debugger alone is $75, and the library source is sold for $300. Manx Software Systems is located at One Industrial Way, Eatontown, NJ 07724, 201/389-0290.

Toss Your Templates

"There must be an easier way to create schematics and PC boards," moan your designers. They're right—**PRO-NET** and **PRO-BOARD** from Prolific Inc. The menu-driven pair offer a complete set of schematic commands, automatic page reference generation and insertion through post processing, flexibility in drawing connectors and weight assignment to assure important signals receive high priority in PC board routing. PRO-NET, the schematic capture CAD system, includes libraries, library editor, zoom, bus bundle and signal name stepping, repeat, signal naming and stepping, orthogonal rubber banding, variable template and paper sizes, gate swapping, negative logic and more. The program will even generate a net list, bill of materials, component map and error report.

PRO-BOARD then takes the net list and generates up to a four-layer printed circuit board with Silk Screen. When a via is added, PRO-BOARD automatically flips layers. If you need help routing traces but aren't sure which layer to select, toggle on the automatic layer selection. The package supports both dot and laser printers as well as plotters, Gerber output and .025 grid. The cost for each program is $475. For a complete list of features contact Prolific, Inc., 1808 W. Southgate Avenue, Fullerton, CA 92633, 714/447-8792. ►



A schematic from PRO-BOARD.

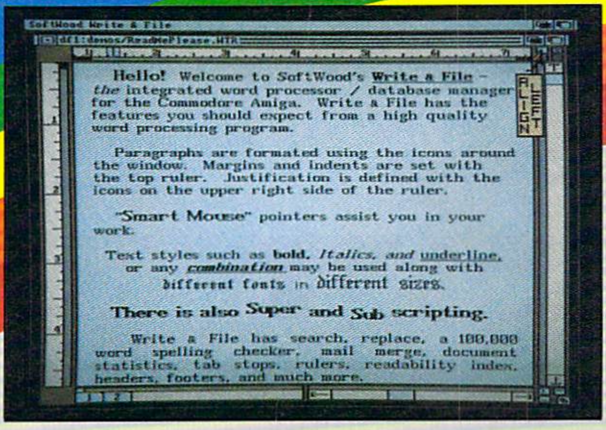
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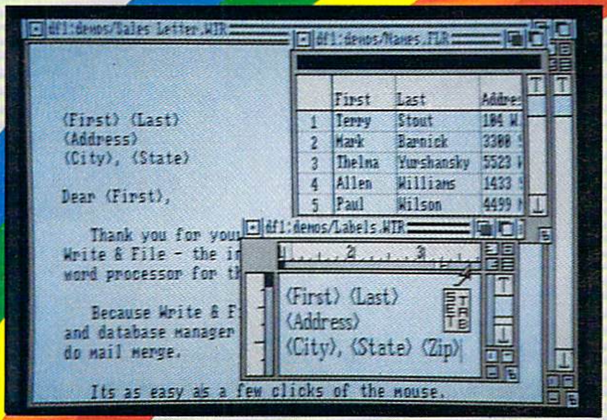
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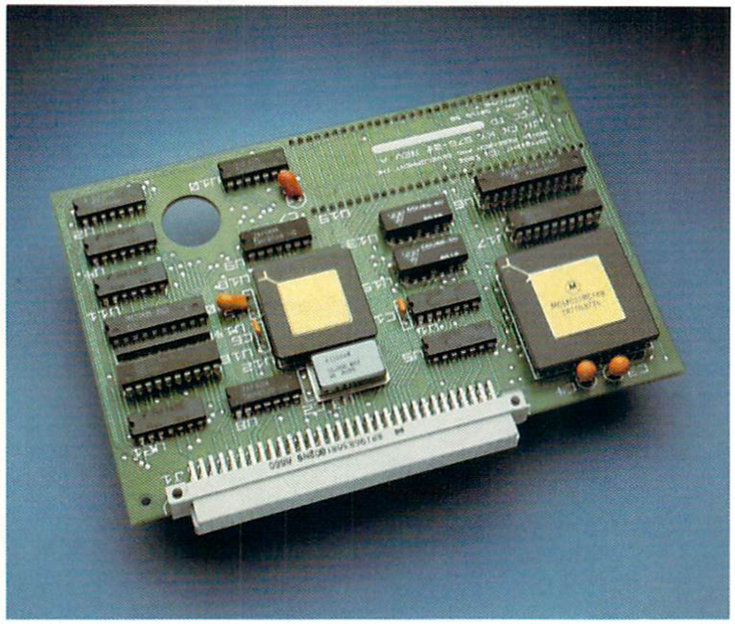
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Get Blown Away

Hurricane, an accelerator board containing both a Motorola 68020 microprocessor and a 68881 math coprocessor, is designed to replace the Amiga's 68000 mircoprocessor. Using 32-bit RAM, Hurricane doubles the execution speed of 16-bit while retaining full software compatibility. Also available is a memory board with up to two megabytes of 32-bit RAM that you can attach directly to Hurricane. Both Hurricane ($950 with processors; $495 with sockets for processors) and the connector board ($900 including two meg; $495 unpopulated) are distributed by Finally Technologies, 25 Van Ness, Suite 550, San Francisco, CA 94102, 415/564-5903.



The Hurricane board with 68020 and 68881 chips.

Barnstormers Beware

The most dangerous airborne racer of 1932, the GeeBee, is at your command in Activision's new arcade-style racing game, **GeeBee Air Rally**. You must fly over, under and around the competition, without cutting too close and colliding in mid-air. GeeBee Air Rally offers over 250 levels of difficulty through a progression of 16 race courses, each with different 3-D scrolling graphics. Adept pilots can test their control on the two slalom and two balloon breaker courses. You can buy your wings for $39.95. Radio in to Activision at PO Box 7286, Mountain View, CA 94039, 415/960-0410.

The Ol' Switch-a-roo

If you've ever wanted to share objects between Sculpt 3D and VideoScape 3D, your wish has just been answered. **InterChange** enables you to edit and transfer color and texture information as well as script files from one format to the other. The core of InterChange, the master program, works together with separate multitasking modules for each graphics program. The package, including the master program and the Sculpt 3D and VideoScape 3D modules is sold for $49.95. Syndesis promises modules for other 3-D programs will follow. Call or write for more information: 20 West Street, Wilmington, MA 01887, 617/657-5585. ►

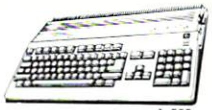
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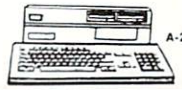
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Circle 134 on Reader Service card.

Genlock to the Rescue

While it doesn't wear a cape emblazoned with an S, the **Super Gen** could swoop in and save your video production. At least, that's what Progressive Image Technology hopes. The Super Gen sports two NTSC RS-170A outputs, BNC connectors, a Loop Through input, with switchable termination; a Loop Through output and 3.58 Mhz Notch Filter. The Input Clap, Setup Adder and Key Out Signal (TTL or 1vpp.) are all switchable. You can also program the Vertical Start Position and Field Start. As for Dissolves, you can use the external Video Dissolve slider, the Amiga Graphics Dissolve slider, the switchable Auto Interpret color table dissolves or the Program Control dissolves with one six-bit DAC for each slider providing 64 levels of dissolve. The Blanking Source is also selectable. Interested videophiles with $749.95 should contact Progressive Image Technology's distributor, Digital Creations, at 1333 Howe Ave. Suite 208, Sacramento, CA 95825, 916/344-4825.

A Pal Named Max

MAX—The Hard Disk System Hackers Package is a construction project that lets the technically inclined add up to four hard disks to an Amiga 1000 or 500. You can configure the system for up to two MFM or RLL type IBM-compatible controller boards, each with multiple drives (four drive maximum) that can have one or more partitions. Connecting to, or passing, the expansion bus, the system uses the Mount command for increased control of disk parameters and a CMOS interface for low bus loading. On the 1000, it even lets you use version 1.1 software. On the 2000, MAX will set up a controller and drives to use on the IBM side.

The construction project won't void your warranty, no internal modifications of the machine are required. MAX includes a driver, configurator, a hard-disk formatter and exerciser with sector level data manipulation, interface schematics, assembly and installation instructions, a list of component vendors and Electronic Horizons' full and incremental backup and restore utlity. Quite a bargain for $199. For more specifics, contact Palomax Inc., 424 Moreboro Rd., Hatboro, PA 19040, 215/672-6815.

Animated Ideas

You've got great eight-color IFF pictures from paint, image-capture and text-generation programs, but they just sit there. Animate and propel them into 3-D with **Video Effects 3D** from InnoVision Technology. You may animate as many as 99 objects simultaneously, controlling the 3-D path, rotation, spin, size and speed of each. You can extrude two-dimensional objects into 3-D for further manipulation. Object rotation moves at 30 frames per second. The borderless screen has a resolution of 704 × 452 pixels. To check your animation before recording to videotape, Video Effects 3D will play back what is still in memory at 60 frames per second. Video Effects 3D sells for $249; for details contact InnoVision Technology, PO Box 743, Hayward, CA 94543, 415/538-8355. ■

Fast Times with Benchmark Modula-2™

Benchmark offers a programming environment so easy-to-use, so comprehensive, so failsafe, and so fast you can't wait for your next session at the computer. No more wasting time wondering is it the compiler or your code. Benchmark creates a hassle-free environment which allows you to concentrate your energy on programming, instead of fighting the compiler. Leon Frenkel, the developer of Benchmark, debugged the product so you don't have to.

Benchmark delivers:

Fast Compile Speeds: Compiles average 10,000 lines per minute with burst speeds of 30,000 lines per minute to give you phenomenal boosts in productivity.

Reliability: If your code doesn't compile, you don't have to be concerned about the compiler. In addition, Benchmark's environment makes it extremely easy to edit your corrections and then proceed to recompile.

Convenience: All major activities can be executed from the EMACS style Editor with function keys. With Benchmark it is literally:

- ► F2 for Compile
- ► F3 for Link
- ► F4 for Run

Optimized Code: Resultant program size and speed optimized to be similar to programs written under Aztec 'C'.

Full Documentation: Benchmark's 700 page manual includes examples of every procedure, in addition to the quick reference available on menus.

Source Code Demos: Most programmers learn by example. Over 100 demo programs included which can be incorporated in your own programs.

Expandability: Benchmark offers three add-on libraries of highly useful functions and routines.

► Benchmark 'C' Language Standard Library: Includes functions to help easily move programs written in 'C' into Benchmark's state-of-the-art programming environment. Offers the capability to include advanced 'C' language functions in Modula-2 programs such as: printf, fprintf, scanf, fscanf, fopen, fclose, fseek, open, close, create, lseek, malloc, calloc, free, etc.

► Benchmark Simplified Amiga Library: Includes routines which are common to nearly every Amiga program. Saves weeks of programming and debugging with functions for screen creation, window creation, menu creation, console handling, port handling, speech synthesizer handling, graphic elements, gadget creation, double buffered animation handling, and many others.

► Benchmark IFF and Graphic Image Resource Library: Includes a set of functions for handling IFF Format Files and for Incorporating bit-mapped images to be integrated into Modula-2 programs as a resource. Supports three types of formats: Intuition or BOB format, Simple Sprite, and Virtual Sprite Format.

You have the choice of either using Benchmark's EMACS style Editor with its menus listing frequently accessed commands and their key equivalents or using your own favorite Editor.

Benchmark's integrated environment with the Editor frees you from having to list errors, look up the line number of an error, and then loading in the Editor to correct the error.

Benchmark Modula-2: Software Construction Set comes with:

► Amiga hardware/software support libraries including: Intuition, ROM Kernel, Amiga DOS, Workbench, etc.

► Standard Modula-2 libraries including: FileSystem, InOut, Storage, Terminal, MathLib8, etc.

► Over 100 demonstration programs, complete with source code, show the usage of many of the Amiga functions such as windows, graphics, multitasking, menus, and gadgets in programs such as a free-hand paint program, desktop calculator, gadget based directory maintenance program, ray tracing programs, etc.

► A fast cross reference utility for both user and system created libraries.

► Utility for loading large numbers of files quickly into RAM based disks.

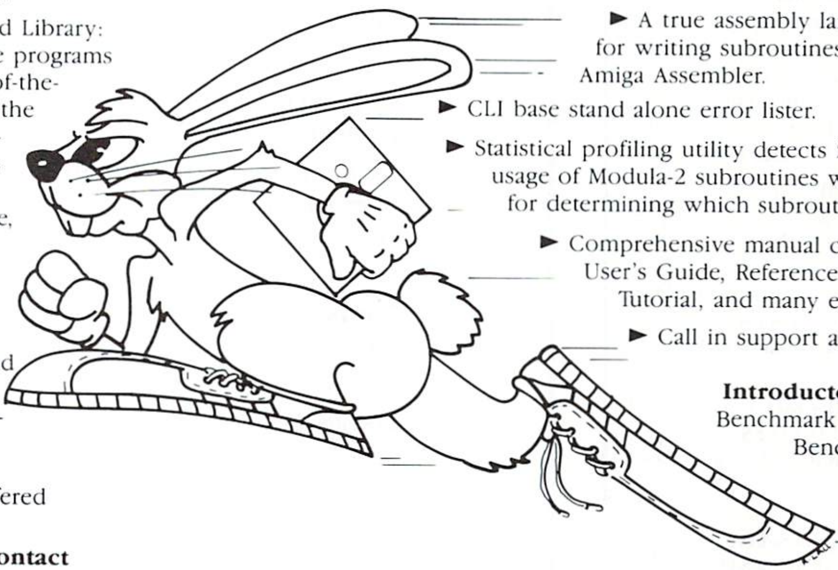
► A true assembly language interface for writing subroutines using the Amiga Assembler.

► CLI base stand alone error lister.

► Statistical profiling utility detects frequency of usage of Modula-2 subroutines within programs for determining which subroutines to otimize.

► Comprehensive manual complete with User's Guide, Reference Guide, Editor Tutorial, and many examples.

► Call in support available.



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From whence does Load-and-Run's knowledge emanate?

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By Louis R. Wallace

512 Too Much

Q: I have an Amiga 500 with the A501 512K expansion installed and have come across a few pieces of software that will not run correctly with the extra memory. I can get around the problem somewhat by using the Workbench NoFastRam tool and then the CLI, but this can sometimes be a problem in itself.

It seems the ideal way would be to insert the NoFastMem program into the Startup-sequence of the software. However, it does not have any return code (once called from the CLI the cursor doesn't come back unless I reboot or use CTRL-C). How do I use NoFastRam from the Startup-sequence and still have control of my Amiga?

E. Secretan
Miami, FL

A: The answer is one of the Amiga's special features—multitasking. Just use the AmigaDOS command RUN from your Startup-sequence to activate the NoFastRam program. It will create its own task, leaving the Startup-sequence to continue as before. I suggest you make up a separate Workbench disk with RUN SYSTEM/NOFASTRAM inserted in the Startup-sequence, and use it when you need to run programs that can't handle more than 512K.

Out the Mouse

Q: Where can I find information about using the Amiga 500's mouse ports to control a device connected to them? I need to send information out these ports. Also, can you tell me how to use Hold-and-Modify mode from Amiga Basic or refer me to a book with this information?

V. Dayal
Hoboken, NJ

A: You are going to need *The Amiga Hardware Reference Manual* which documents everything about the Amiga's hardware. I also suggest you get *The Amiga ROM Kernel Reference Manual: Libraries and Devices*. Both are available from the Addison-Wesley Publishing Company.

As for using Hold-and-Modify (the HAM 4,096-color mode) from Amiga Basic, my first impulse is to say you can't. However, since Amiga Basic allows so much access to Intuition and the ROM kernel routines via its LIBRARY statements, I won't say it is impossible. But, I'll bet that it would require you to emulate C structures and functions so much in the Basic program that it would be easier to just write it in C in the first place. For more information on the HAM mode, see the ROM kernel manual, as well as *The Amiga Intuition Reference Manual*, also from Addison-Wesley. And if you need a good book on beginning C programming on the Amiga, I recommend *Inside the Amiga* by John Berry and available from Howard W. Sams & Company ($22.95).

Book Learning

Q: Since I have little opportunity to mingle with other Amiga users, everything I learn is from reading and experimenting. I bought two books on AmigaDOS published by Compute! that were extremely difficult reading for a beginner and were largely a waste of money. The Introduction to the Amiga manual mentions I should see the AmigaDOS User's Manual *to learn about the CLI. I didn't get an* AmigaDOS User's Manual *with my computer. Was I supposed to? I would like to know who published the Amiga CLI manual and where I could purchase it.*

R. Crichton
Millington, TN

A: The manual you are referring to is part of the early technical reference manuals and not part of the supplied documentation. However, it is essential that you learn AmigaDOS if you wish to get the most out of your Amiga, as the Workbench graphic interface doesn't allow you the level of control of CLI.

The AmigaDOS User's Manual is now part of *The AmigaDOS Manual* from Bantam Computer Books ($24.95). The book also contains *The AmigaDOS Developers Manual* and *The AmigaDOS Technical Reference Manual*, so you are actually getting three books in one. Be warned however, if you found the Compute! books difficult, this will very likely be even more so. I suggest you try to find an Amiga user's group. You might be surprised how much easier some of these things can be to learn if someone shows you the first time. And, of course, keep reading *AmigaWorld*. We have had several articles on using AmigaDOS, including "Beginner's Guide to the CLI" in the *1987 AmigaWorld Special Issue*.

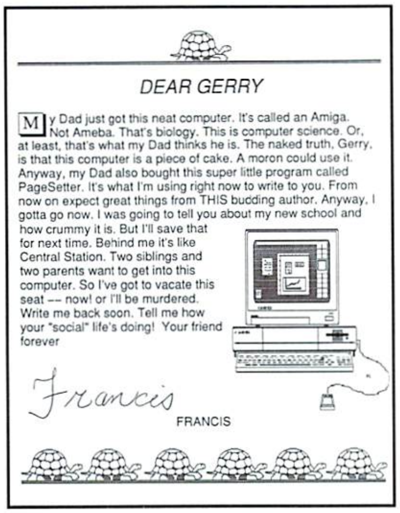
She *Does* Do Windows

Q: From Amiga Basic, is it possible to completely specify the active window, without having to click the mouse in the one you want? I would like my multiwindow programs to activate the proper window so a user could just start typing data. So far I have tried various forms of the WINDOW command, but no luck. Any ideas?

B. Gibson
Hancock, NH

A: I had to call Amiga Guru Carolyn Scheppner on this one. Her answer is yes, it can be done by calls to the Intuition library from Amiga Basic. You need the ActivateWindow routine. (ActivateWindow is a function available only under 1.2.) But be warned! You must not be using any gadgets or requestors when it is being called, or the results may not be what you expected. The easiest way to avoid surprises is to use windows with no gadgets for the user to mess around with, and make sure you use a custom screen or at least cover the Workbench windows with your gadgetless windows. You also must use a window with a type of 16, which has its contents refreshed when you call it. Otherwise, the window will be cleared when activated.

The following program demonstrates how to use ActivateWindow with Amiga Basic to completely activate the desired ►

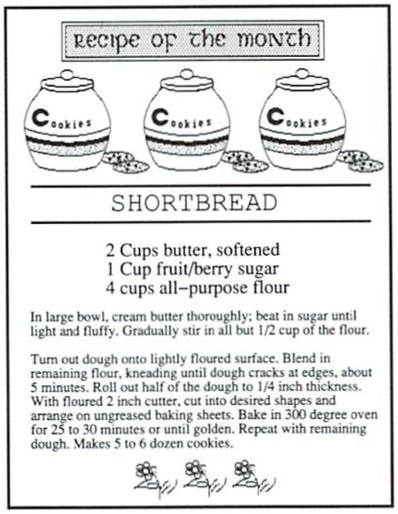

DEAR GERRY

My Dad just got this neat computer. It's called an Amiga. Not Ameba. That's biology. This is computer science. Or, at least, that's what my Dad thinks he is. The naked truth, Gerry, is that this computer is a piece of cake. A moron could use it. Anyway, my Dad also bought this super little program called PageSetter. It's what I'm using right now to write to you. From now on expect great things from THIS budding author. Anyway, I gotta go now. I was going to tell you about my new school and how crummy it is. But I'll save that for next time. Behind me it's like Central Station. Two siblings and two parents want to get into this computer. So I've got to vacate this seat -- now! or I'll be murdered. Write me back soon. Tell me how your "social" life's doing! Your friend forever

Francis

FRANCIS

Spice up your correspondence


Recipe of the month

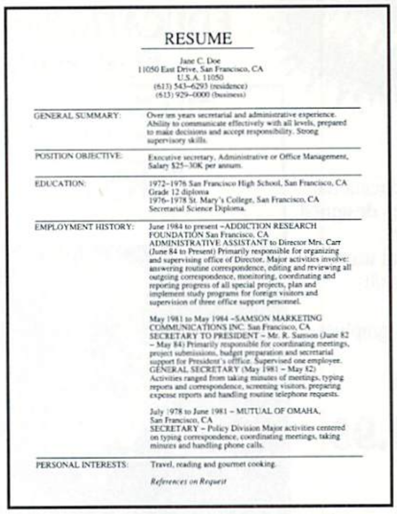
SHORTBREAD

2 Cups butter, softened
1 Cup fruit/berry sugar
4 cups all-purpose flour

In large bowl, cream butter thoroughly; beat in sugar until light and fluffy. Gradually stir in all but 1/2 cup of the flour.

Turn out dough onto lightly floured surface. Blend in remaining flour, kneading until dough cracks at edges, about 5 minutes. Roll out half of the dough to 1/4 inch thickness. With floured 2 inch cutter, cut into desired shapes and arrange on ungreased baking sheets. Bake in 300 degree oven for 25 to 30 minutes or until golden. Repeat with remaining dough. Makes 5 to 6 dozen cookies.

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RESUME

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GENERAL SUMMARY:	Over ten years secretarial and administrative experience. Ability to communicate effectively with all levels, prepared to make decisions and accept responsibility. Strong supervisory skills.
POSITION OBJECTIVE:	Executive secretary, Administrative or Office Management, Salary $25–30K per annum.
EDUCATION:	1972–1976 San Francisco High School, San Francisco, CA Grade 12 diploma 1976–1978 St. Mary's College, San Francisco, CA Secretarial Science Diploma.
EMPLOYMENT HISTORY:	June 1984 to present –ADDICTION RESEARCH FOUNDATION San Francisco, CA ADMINISTRATIVE ASSISTANT to Director Mrs. Carr (June 84 to Present) Primarily responsible for organizing and supervising office of Director. Major activities involve: answering routine correspondence, editing and reviewing all outgoing correspondence, monitoring, coordinating and reporting progress of all special projects, plan and implement study programs for foreign visitors and supervision of three office support personnel. May 1981 to May 1984 –SAMSON MARKETING COMMUNICATIONS INC. San Francisco, CA SECRETARY TO PRESIDENT – Mr. R. Samson (June 82 – May 84) Primarily responsible for coordinating meetings, project submissions, budget preparation and secretarial support for President's offfice. Supervised one employee. GENERAL SECRETARY (May 1981 – May 82) Activities ranged from taking minutes of meetings, typing reports and correspondence, screening visitors, preparing expense reports and handling routine telephone requests. July 1978 to June 1981 – MUTUAL OF OMAHA, San Francisco, CA SECRETARY – Policy Division Major activities centered on typing correspondence, coordinating meetings, taking minutes and handling phone calls.
PERSONAL INTERESTS:	Travel, reading and gourmet cooking. *References on Request*

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windows. The program requires the Intuition.bmap file, which can be made from the Intuition FD files (from the FD directory on the 1.2 EXTRAS disk) using CONVERTFD.

```
LIBRARY "intuition.library"
' create four windows
' get pointer to each window
  and save it
WINDOW 2,"window 2",(0,0)-
  (300,80),16
w&(1) = WINDOW(7)
WINDOW 3,"window 3",
  (315,0)-(615,80),16
w&(2) = WINDOW(7)
WINDOW 4,"window 4",(0,98)-
  (300,180),16
w&(3) = WINDOW(7)
WINDOW 5,"window 5",
  (315,98)-(615,180),16
w&(4) = WINDOW(7)
RANDOMIZE TIMER
ON BREAK GOSUB getout
BREAK ON
top:
' choose a window randomly
i = INT(RND*4) + 2
WINDOW i
' activate selected window
ActivateWindow(w&(i-1))
PRINT "current window"
INPUT "Enter something:";a$
PRINT a$
IF a$ = "quit" THEN GOTO
  getout
GOTO top
getout:
FOR i = 2 TO 5
WINDOW CLOSE i
NEXT
LIBRARY CLOSE
BREAK OFF
END
```

IBM CAD

Q: I have a standard Amiga 1000, and I need to be able to use AutoCAD (an MS-DOS CAD package). Is this possible? Would I use a software package like DOS-2-DOS (Central Coast Software) to translate it? How do I emulate the IBM?

T. Veldboer
Netherlands

A: Yes, it is possible, but it is not cheap. In fact, it would be less expensive to buy an MS-DOS clone just for running AutoCAD. The answer is not a package like DOS-2-DOS, which is for converting disk-based data files (mostly ASCII) between the two computers. The only way to do it with the A1000 is to buy the Amiga SideCar, an expansion chassis with an IBM-compatible computer built into it. This will allow you to use IBM software, including AutoCAD, but, as I said, it will cost as much as a dedicated MS-DOS computer.

With an A2000, you could get IBM emulation with the Bridgeboard, which plugs into an A2000 internal expansion slot.

Disguised Drive

Q: I recently upgraded from the A1000 to the A2000. Since my 2000 has only one internal drive, I am using the external drive from my A1000 system. The problem is the A2000 thinks my external drive is df2: instead of df1:! Since a lot of software looks for df1: (like DPaint II), it is causing me problems.

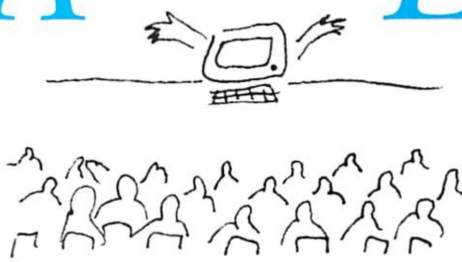
I.J. Reilly
New Orleans, LA

A: There's nothing wrong, that's the way it should be. The A2000 expects to find the first two drives (df0: and df1:) mounted inside; any external drives are referenced starting with df2:. It might be possible to install the older external drives inside the A2000, but I haven't heard of anyone doing it. Here's another solution. On the Fred Fish Disk #79 there is a program called AssignDev. This allows you to change df2: to df1:, and your software will look at df2: when it wants df1:. This is a temporary fix that disappears when you power down or do a soft reset. Add a line to your startup-sequence that runs AssignDev as a task:

```
run AssignDev
```

This will automatically make the change when you turn on the A2000. ■

CALL



FOR AUTHORS

NewCLI

1> Silver-blue, ice-blue, glass-blue, fire-blue. Sharp, thin lines that smoothed as they rotated, then zigzagged as the antialiasing routines cut in and out. Fractal shapes, lines, features were being generated at almost real-time speeds, the 68881 floating-point co-processor and 68020 were silently screaming along at near 15 MHz. Lightning-blue fast and bell-blue quiet.

NewCLI

2> Crystaline sounds of 1/f sub-cerebral music shimmered stereoscopically from a pair of acoustically matched Klipschorne mega-speakers dominating the corners of a room that was fading in the CRT glow-blue of an Amiga set free. ADSR, harmonics and waveforms balanced by an AI-controlled sequencer fed feedback to itself through a stereo digitizer with an unheard-of sampling rate.

NewCLI

3> The video cameras pointed at the monitor, pumping electronic signals through mixers, SEGs, phase shifters, then the genlock through the VCR through the digitizer through the Amiga through the paint program through the animation program through the monitor through the cameras.

NewCLI

4> Hard drives and floppies hissed and clicked as images and sounds were converted to IFF, ARC compressed, sorted and stored. RAM DOS C/Commands to save time and swapping, though memory was precious, even with 10.25 megs (zero wait state) on board.

NewCLI

5> A pixel-sized window searched, compared, selected. Called up files, executed UnARC, the image would decompress and UnARC self destruct so the task could clip, rotate and superimpose ever more detailed HAM images showing the core of an electric process as infinitely dissectable, expandable, zoomed as a Mandelbrot.

NewCLI

6> Modem lights flickered. The tin-can buzz of a dial tone added to the audio madness then tick. . .ticktickticks. . .ticktick. . .tick. . . wait, click, pause. SCREEEEEEEEEEEEEECH, quiet. CONNECT. Even parity, 8-bit words, no stop bits, 1200-baud passwords in full duplex. A file uploaded a file down.

NewCLI

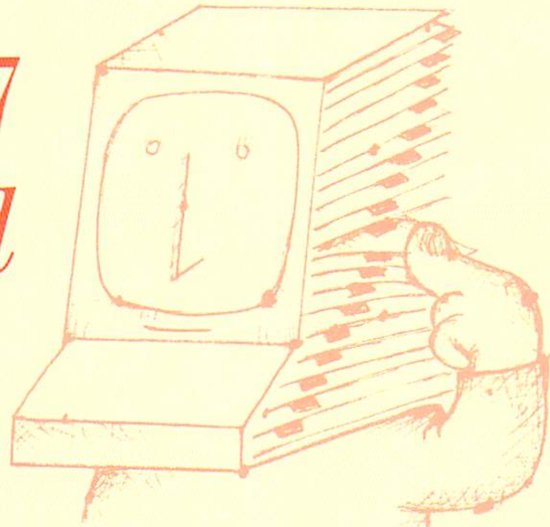
7> ed "author guidelines"
Creating new document
To AmigaWorld <Return>
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I thought that it might make an interesting story for your magazine. <Return>
I would like to know more about taking that critical next step. <Return>
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Please send me a copy of your author guidelines. <Return>
I have enclosed a self-addressed stamped envelope. <Return>
Thank you for your time. <Return>
I owe you everything. <Return>

ESC

*X Return
7> copy "author guidelines" to PRT: The printer began chattering back and back and forth and back. Form feed. Quiet. . .EndCLI
6> BYE, Logoff 10:15, Disconnect. . .EndCLI
5> Reset palette. . .EndCLI
4> INFO, DF1:,DF0:,DF2:,DH0. . .volumes available, percent full, errors zero. . .EndCLI
3> The video image stabilized then faded. . .EndCLI
2> The sound stilled. . .EndCLI
1> LoadWB
EndCLI >NIL:

Index to 1987 *AmigaWorld* Articles



ARTICLE	AUTHOR	ISSUE	PAGE
Business			
Amigas at Work	Herrington	November	24
Buyers Guides/Lists:			
The *AmigaWorld* New Year's Hardware Buyers Guide	Ryan, Laughner	Jan/Feb	36
Business Buyers Guide	Barrett	November	30
The Great *AmigaWorld* Software Buyers Guide	Barrett, Ryan	December	35
Index to 1985-86 *AmigaWorld* Articles	Staff	Jan/Feb	108
Education			
Alternative Education: Learning by Amiga	Randall	November	20
General			
1987 Editors' Choice Awards	Staff	December	66
Amiga Book Roundup	Wallace	Jan/Feb	66
Amigas in the Performing Arts	Brown, Means and Means, Herrington	December	71
Searching the Heavens	Herrington	November	71
User Groups Extraordinaire	Herrington	July/Aug	62
Graphics/Video			
Amiga CAD	Wallace	May/June	32
Caligari: Software for the Video Professional	Lipson	Jan/Feb	24
Desktop Video	Erzinger	Jan/Feb	16
Graphic Hardcopy and the Amiga	Kevelson	Mar/Apr	36
Graphic Scene Simulations	Graham	May/June	18
Tangible Graphics: Capturing Amiga Screens on Paper, Film and Videotape	Staff	Special	44

►





ARTICLE	AUTHOR	ISSUE	PAGE
The Bard's Tale	Wright	May/June	78
Chessmaster 2000	Wright	May/June	84
Chessmate	Wright	May/June	85
Computer Baseball	Laflamme	Mar/Apr	92
Defender of the Crown	Ryan	Mar/Apr	80
The FaeryTale Adventure	Wright	November	90
Flight Simulator II	Wallace	May/June	78
Grand Slam Tennis	Randall	November	89
Gridiron!	Ryan	Mar/Apr	90
Hacker	Laflamme	July/Aug	82
Little Computer People Discovery Kit	Jacob	Jan/Feb	91
Marble Madness	Laughner	Mar/Apr	93
Mean 18, Leader Board	Staff	Jan/Feb	88
Mindwalker	Laughner	July/Aug	82
The Pawn	Wright	May/June	84
SDI	Randall	Sept/Oct	87
Shanghai	Laughner	July/Aug	82
Silent Service	Ryan	November	90
Sinbad and the Throne of the Falcon	Randall	November	91
Star Fleet I: The War Begins	Ryan	May/June	81
Starglider	Wallace	December	92
Strip Poker	Wright	July/Aug	82
Tass Times in Tonetown	Barrett	May/June	81
Transylvania, Crimson Crown	Wright	May/June	83
Uninvited	Wallace	December	91
World Games	Laughner	May/June	81

Reviews: Hardware

Digi-View	Kalisher	Jan/Feb	76
Easyl	Ludwick	November	74
Imprint and the Polaroid Palette	Goode	November	76
MAS-Drive20 20MB Hard Disk and Controller	Ryan	Mar/Apr	82
Xerox 4020 Color Ink jet Printer	Kevelson	Sept/Oct	69

Reviews: Software

A-Talk Plus	Herrington	November	88
Acquisition	Willen	November	82
AiRT Programming Language	Leemon	December	81
AmigaTerm, MiddleMan, A-Term, MacroModem	Herrington	May/June	72
B.E.S.T. Business Managment	Salamone	July/Aug	70
City Desk	Ludwick	December	79
CLImate	Wallace	December	86
Datamat A-200	Willen	May/June	60
dBMAN	Salamone	Sept/Oct	85
DeluxePaint II Update	Goode	May/June	62
DeluxePrint	Reifsnyder	Jan/Feb	82
DeluxeVideo	Ludwick	May/June	54
Diga!	Herrington	November	84

►

Software/Hardware:

Telecommunications:

■

Micro P Technologies

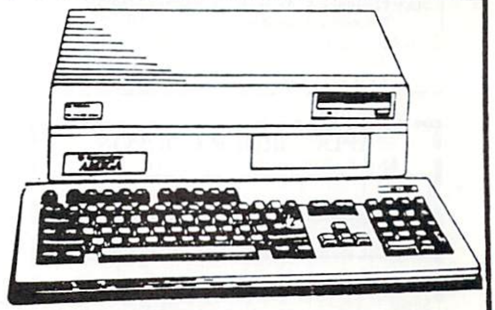
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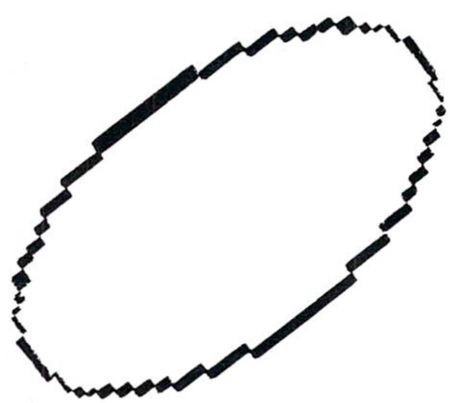
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102	107	112	117	122	302	307	312	317	322	502	507	512	517	522
103	108	113	118	123	303	308	313	318	323	503	508	513	518	523
104	109	114	119	124	304	309	314	319	324	504	509	514	519	524
105	110	115	120	125	305	310	315	320	325	505	510	515	520	525
126	131	136	141	146	326	331	336	341	346	526	531	536	541	546
127	132	137	142	147	327	332	337	342	347	527	532	537	542	547
128	133	138	143	148	328	333	338	343	348	528	533	538	543	548
129	134	139	144	149	329	334	339	344	349	529	534	539	544	549
130	135	140	145	150	330	335	340	345	350	530	535	540	545	550
151	156	161	166	171	351	356	361	366	371	551	556	561	566	571
152	157	162	167	172	352	357	362	367	372	552	557	562	567	572
153	158	163	168	173	353	358	363	368	373	553	558	563	568	573
154	159	164	169	174	354	359	364	369	374	554	559	564	569	574
155	160	165	170	175	355	360	365	370	375	555	560	565	570	575
176	181	186	191	196	376	381	386	391	396	576	581	586	591	596
177	182	187	192	197	377	382	387	392	397	577	582	587	592	597
178	183	188	193	198	378	383	388	393	398	578	583	588	593	598
179	184	189	194	199	379	384	389	394	399	579	584	589	594	599
180	185	190	195	200	380	385	390	395	400	580	585	590	595	600

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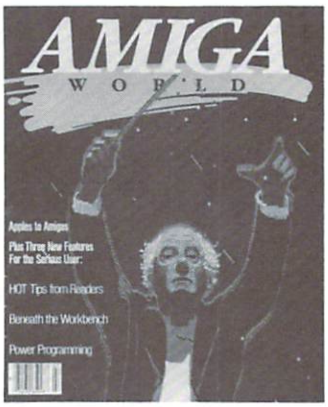
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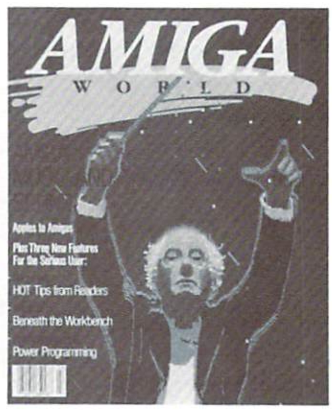
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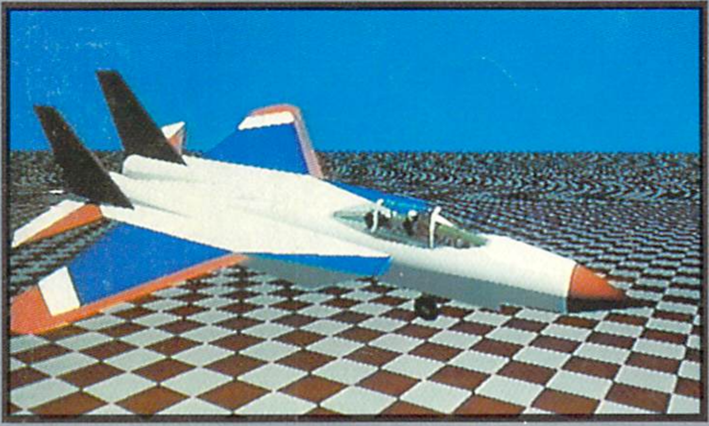
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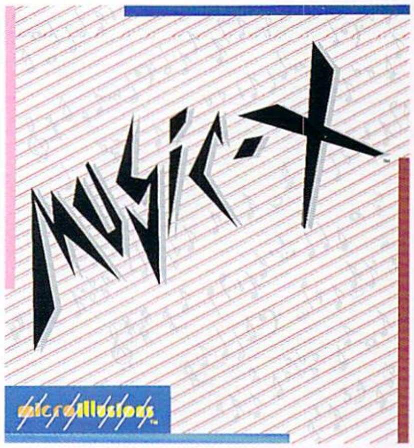
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MUSIC-X™



MUSIC X SOFTWARE, *like a fine instrument is crafted from the heart. It is more than an excellent tool, it is also a work of art.*

COMMITMENT: *We have committed ourselves to pushing ahead state of the art in professional music software, enabling you to open new worlds of creativity at a cost, both in hardware and software, that is well within the budget of any serious musician.*

NO COMPROMISES *or shortcuts have been tolerated as we designed this product. The master clock is accurate to 1 millisecond with a resolution of 192 clocks per quarter note. Sequences and library data can be any length, limited only by available memory — if you want, you can dump a 100K or larger sample into a library entry!*

KEYBOARD MAPPING *features allow almost any function of the sequencer to be controlled from a MIDI keyboard, footpedal, or other MIDI device. This includes starting/stopping the sequencer, initiating sequences, and even changing the key map itself!*

REAL TIME: *The system supports real-time recording of systems exclusive data, as well as full graphic-oriented and event-oriented editing of sequences. You can even record while in edit mode and watch notes appear on your edit display as you play them!*

LIBRARIAN: *A configurable librarian is included with the program. You can teach the librarian how to communicate with any MIDI instrument which outputs system exclusive data.*

EDITING: *An impressive battery of editing features will be supported. In fact, new editing features are being added daily as we interact with our network of working, professional musicians whose input has greatly contributed to the quality of this program.*

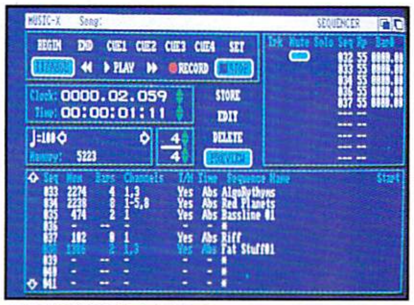
COMMITMENT: *Our commitment to music production does not stop here. A future product, Patch Editor Construction Kit, will allow you to create graphical patch editors for virtually any synthesizer you may own. Some technical knowledge will be required, but since patch editors, once created, can be traded between users, you should have no problem getting an editor for your needs.*

THE POWER: *Part of the power of Music-X comes from the computer it was created for: The Amiga, one of the most powerful and inexpensive personal computers available. At last you can run these many powerful applications in an environment that is a pleasure rather than a chore to use!*

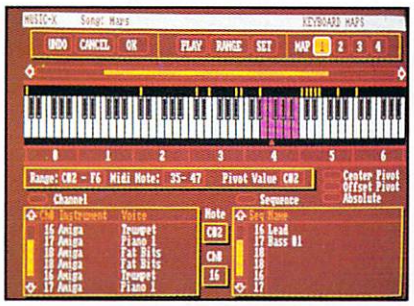
MICRO MIDI: *Although Music-X will work with any of the many MIDI interfaces for the Amiga, we offer our own MIDI interface which we feel is a cut above. It features six outputs (each output switchable as OUT, THRU or OFF), two switch-selectable inputs, a channel loading indicator, and an external clock output (sync/start stop) for synchronizing older, non-MIDI drum machines, and a serial pass-thru!*

MICRO SMPTE: *This complete SMPTE Reader will allow Music-X to synchronize with video or audio tape decks. It connects to the Amiga parallel interface and includes a pass-thru so as not to interfere with printer operation. Our Micro SMPTE is compatible with all Amiga models (A500/A1000/A2000).*

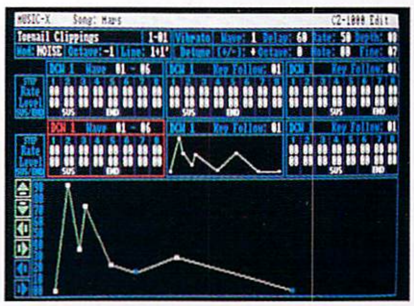
PHOTON VIDEO: *Photon Video is a complete, integrated video animation system. It includes facilities for both 2-D and 3-D animation, as well as automatic tape transport control and real time playback of rendered images. Our 3-D rendering module supports variable light sources, shadows, transparency, and reflections in a 3-D environment. Other modules include Cel Animator, Object Editor and Transport Controller with SMPTE support.*



SEQUENCER PAGE: *Tape transport-type controls allow manipulation of up to 250 sequences; each contain 16 MIDI channels worth of data.*



KEYMAP EDITOR PAGE: *Create keymaps by dragging the mouse over a selected area of the keyboard. The highlighted region can then be redefined in terms of real-time behavior.*



PATCH EDITOR: *A sample patch editor (CZ-1000) of the type that will be included with the product.*

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